DRAFT
DATA APPLICABILITY REPORT

REMEDIAL INVESTIGATION/FEASIBILITY STUDY, NEWTOWN CREEK

Prepared by

Anchor QEA, LLC

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LIST OF ACRONYMS AND ABBREVIATIONS

AACC	American Agricultural Chemical Company
AFS	AIRS Facility Subsystem
AIRS	Air Quality Subsystem
AOC	Agreed Order on Consent
ArcGIS Online	ESRI's "10.0 North America Geocode Service" and "10.0 US Streets Geocode Service"
ASAC	Activity Specific Acceptance Criteria
AST	aboveground storage tank
BCP	Brownfield Cleanup Program
BPL	Brooklyn Public Library
BSP	Bulk Storage Program
BTEX	benzene, toluene, ethylbenzene, and xylene
CBOD5	carbonaceous biochemical oxygen demand
CBS	Chemical Bulk Storage
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
COPC	constituent of potential concern
CRA	Conestoga-Rovers and Associates
CSM	conceptual site model
CSO	combined sewer overflow
CVOC	chlorinated volatile organic compound
CWA	Clean Water Act
CWG	carbureted water gas
DAR	Data Applicability Report
DCP	Data Collection Plan
DMP	Data Management Plan
DMR	discharge monitoring report
DQO	Data Quality Objective
EDR	Environmental Data Resources, Inc.
EMS	EMS Environmental, Inc.
ERM	Environmental Resources Management Group, Inc. – Northeast

ESI	Environmental Site Investigation
ESRI	Environmental Sciences Research Institute
FHWA	Federal Highway Administration
FRS	Facility Registry System
FSAP	Field Sampling and Analysis Plan
GAC	granular activated carbon
GIS	geographic information system
HDR	Historical Data Review
HRS	hazard ranking system
IEC	Interstate Environmental Commission
IHWDS	Inactive Hazardous Waste Disposal Site (or state Superfund)
IPP	Industrial Pretreatment Program
lbs/day	pounds per day
LIRR	Long Island Rail Road
LISJ	Long Island Star Journal
LMS	Lawler, Matusky, and Skelly Engineers
LNAPL	light nonaqueous phase liquid
LQG	large quantity generator
MANY	The Merchants' Association of New York
MDAC	Minimum Data Acceptance Criteria
MGD	million gallons per day
MGP	manufactured gas plant
MLLW	mean lower low water
MOSF	Major Oil Storage Facility
MSL	mean sea level
MTBE	methyl tertiary butyl ether
NAPL	nonaqueous phase liquid
NAPP	National Aerial Photography Program
NCBOA	Newtown Creek Brownfield Opportunity Area
NEPCCO	New England Pipe Cleaning Company
NOAA	National Oceanic and Atmospheric Administration
NOV	Notice of Violation
NPDES	National Pollutant Discharge Elimination System

NPL	National Priorities List
NYC	New York City
NYCDCP	New York City Department of City Planning
NYCDEP	New York City Department of Environmental Protection
NYCDOITT	New York City Department of Information Technology and Telecommunication
NYSBOH	New York State Board of Health
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYSDOS	New York State Department of State
NYSDOT	New York State Department of Transportation
NYSL	New York State Library
NYSWPCB	New York State Water Pollution Control Board
NYT	New York Times
OU6	Operable Unit 6
OWS	oil-water separator
PAH	polycyclic aromatic hydrocarbon
PBS	Petroleum Bulk Storage
PCB	polychlorinated biphenyl
PDRC	Phelps Dodge Refining Corporation
POTW	publicly owned treatment works
ppm	parts per million
PWSID	Public Water System Identification Number
QAPP	Quality Assurance Project Plan
RCRA	Resource Conservation and Recovery Act
Respondents	Newtown Creek AOC Respondents
RHA	River and Harbor Act
RI/FS	Remedial Investigation/Feasibility Study
SAIC	Science Applications International Corporation
SIU	significant industrial user
SMIA	Significant Maritime and Industrial Area
SOW	Secretary of War
SPCC	Spill Prevention Control and Countermeasure

SPDES	State Pollutant Discharge Elimination System
SVOC	semi-volatile organic compound
TAL	target analyte list
TCL	target compound list
TMDL	Total Maximum Daily Load
TOGS	Technical and Operational Guidance Series
TPH	total petroleum hydrocarbons
TRI	Toxic Release Inventory
TSS	total suspended solids
USACE	U.S. Army Corps of Engineers
USCGS	U.S. Coast and Geodetic Survey
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Survey
USGS	U.S. Geological Survey
UST	underground storage tank
VCP	Voluntary Cleanup Program
VOC	volatile organic compound
War Department	War Department United States Engineer Office
WPCP	wastewater pollution control plant

1 INTRODUCTION

This Data Applicability Report (DAR) provides the summation of the historical data collection and review process undertaken to date consistent with the Newtown Creek Remedial Investigation/Feasibility Study (RI/FS) Data Collection Plan (DCP) (Anchor QEA 2011a) and RI/FS Work Plan (AECOM 2011). This work is being performed under an Administrative Order on Consent (AOC) between the Respondents to this AOC and the U.S. Environmental Protection Agency (USEPA) in the USEPA *Comprehensive Environmental Response, Compensation, and Liability Act* (*CERCLA*) program. The RI/FS Study Area is defined in the AOC as Newtown Creek and its tributaries (Dutch Kills, Maspeth Creek, Whale Creek, East Branch, and English Kills) having an approximate 3.8-mile reach (see Figures 1-1 and 1-2) to the high water mark[1].

This DAR reviews the collection and evaluation of historical documentation and data pertaining to the Study Area itself, as well as the collection and evaluation of pre-existing documents and data from upland areas adjacent to the Study Area. The upland area data collection activity is intended to help identify potential significant sources of constituents of potential concern (COPCs) and, to the extent information is available, attempt to quantify the loadings of such sources to the Study Area. The DCP identified upland sites of interest to focus on initially and also established data acceptance criteria for using relevant data through the RI/FS. Generally, historical data collected through the data review process are also useful to continue the development of the conceptual site model (CSM), and as such, historical information relevant to the CSM is reported in this DAR. The Historical Data Review (HDR)

[1] The Newtown Creek Superfund Site Study Area is described in the AOC as encompassing the body of water known as Newtown Creek, situated at the border of the boroughs of Brooklyn (Kings County) and Queens (Queens County) in the City of New York and the State of New York, roughly centered at the geographic coordinates of 40° 42' 54.69" north latitude (40.715192°) and 73° 55' 50.74" west longitude (-73.930762°), having an approximate 3.8-mile reach, including Newtown Creek proper and its five branches (or tributaries) known respectively as Dutch Kills, Maspeth Creek, Whale Creek, East Branch, and English Kills, as well as the sediments below the water and the water column above the sediments, up to and including the landward edge of the shoreline, and including also any bulkheads or riprap containing the waterbody, except where no bulkhead or riprap exists, then the Study Area shall extend to the ordinary high water mark, as defined in *33 CFR §328(e)* and the areal extent of the contamination from such area, but not including upland areas beyond the landward edge of the shoreline (notwithstanding that such upland areas may subsequently be identified as sources of contamination to the waterbody and its sediments or that such upland areas may be included within the scope of the Newtown Creek Superfund Site as listed pursuant to Section 105(a)(8) of *CERCLA)*.

is not complete, and it is recognized that additional information and data are still available that may assist in the completion of the HDR goals and objectives, including the quantification of source loadings.

This DAR is divided into ten sections. Following this introductory section, Section 2 provides the background on the Study Area, RI/FS goals and objectives, the scope and objectives of the HDR, and the RI activities it supports. Section 3 describes the data applicability and acceptance criteria for including historical data in this phase of the RI/FS. Section 4 summarizes the data categories and provides an update to the site CSM. Section 5 reviews the site summary process undertaken for the preliminary identification of sources and potential migration pathways to the creek; this information can be used to further progress the effort of quantifying source loadings to the creek through the RI/FS. Section 6 presents a preliminary evaluation of the potential significance of individual sites based on the information gathered during the site summary process. Eleven potentially significant sites and specific data gaps associated with those sites are presented in Section 7. Data gaps pertaining to the HDR area are identified in Section 8. To the extent further collection of information and filling of data gaps requires assistance from USEPA and New York State Department of Environmental Conservation (NYSDEC), Section 7 and Section 8 are intended to carry through to the Interim Data Report and RI/FS Work Plan Addendum so that identified data gaps may be resolved through the RI/FS. Section 9 discusses next steps, and references are listed in Section 10.

2 STUDY AREA AND RI/FS OVERVIEW

This section describes the Study Area history, provides a summary of the RI/FS objectives, and reviews the objectives and outcomes of the HDR. Additional information on the RI/FS is provided in the RI/FS Work Plan (AECOM 2011).

2.1 History and Current and Future Use

The Newtown Creek area of Brooklyn and Queens has a history of extensive industrial development stretching back to the 1800s. This development resulted in major reworking of the banks and channel for drainage, industrial and municipal discharges, and use for navigation purposes. The channelizing and deepening of Newtown Creek and its tributaries was largely completed to its current configuration by the 1920s and 1930s. This historical development has resulted in changes in the nature of Newtown Creek and its tributaries from a natural drainage condition to one that is largely governed by engineered and institutional systems. Currently, the predominant land uses around Newtown Creek and its tributaries include industrial, manufacturing, transportation, and utility facilities. The majority of land around Newtown Creek and its tributaries is designated by New York City (NYC) as one of NYC's six Significant Maritime and Industrial Areas (SMIAs). NYC's designation of the area around the Study Area as a SMIA reflects NYC's determination that the anticipated future uses of surrounding property include maritime industrial uses as well as other compatible industrial uses.

2.2 RI/FS Goals and Objectives

The goal of the RI/FS is to conduct a scientifically sound, comprehensive investigation of the Study Area following the appropriate USEPA guidance documents and the principles outlined in USEPA's *Contaminated Sediment Remediation Guidance for Hazardous Waste Sites* (USEPA 2005) for the purpose of providing the basis for sound, scientifically-based decisions on the future condition of the Study Area. The following specific objectives have been established to achieve this goal:

1. Identify, quantify, and understand the vertical and horizontal distribution of COPCs in sediment and surface water, and other constituents and stressors that may impact the ecology and quality of the Study Area sediment, water, and biota. This process

will include a complete characterization of COPCs in the Study Area. The synergistic relationships among substances will be considered to the extent necessary for such characterization.

2. Identify and quantify significant loadings of COPCs and, to the extent allowed by the available information, identify the sources of such loadings to the Study Area surface water, sediments, groundwater, and biota. In the case of ongoing upland sources, refer future investigation of sources to the appropriate regulating agency (i.e., the USEPA, the NYSDEC, or the NYC Department of Environmental Protection [NYCDEP]). For more details on evaluation of upland sources, see Section 3.2.4 of the RI/FS Work Plan (AECOM 2011). As stated in USEPA's *Contaminated Sediment Remediation Guidance for Hazardous Waste Sites* (USEPA 2005), sources of contaminants to sediments must be controlled early and, if recontamination is likely to occur, then sources should be controlled prior to establishing end points and prior to the implementation of sediment remedies. Therefore, it is important to identify and control significant sources of contaminants to the Study Area prior to implementing an effective remedy.
3. Understand the key geomorphological, chemical, and biological processes affecting the stability of sediments and the fate, transport, and bioavailability of COPCs.
4. Identify complete and reasonably potentially complete (considering the urban nature of the Study Area and the impact of future contaminant loadings on the ecology and quality of the Study Area) exposure pathways and identify potential current and future human health and ecological risks posed by the COPCs present in the Study Area.
5. Identify and evaluate potential remedial actions that provide meaningful risk reduction and provide the best possible use of the Study Area, considering the urban nature of the Study Area and the impact of future contaminant loadings on the ecology and quality of the Study Area.

2.3 Objectives and Scope of the HDR

The objective of the HDR is to use the extensive pre-existing relevant data (referred to as historical data) for the Newtown Creek drainage area (see Figure 2-1) (i.e., the HDR Area) to support the RI/FS evaluations. These data will: 1) provide a robust basis of input for the

development of the CSM; 2) provide an understanding of the current state of the Study Area; 3) aid in determining data gaps; and 4) aid in the evaluation of potential sources of significant contaminant loadings to the Study Area. These data uses are further described in Section 3.

Three general categories of historical data have been collected and evaluated: environmental data, physical data, and Study Area data. The objectives that guided the collection of these three categories of historical data are described in the following sections.

Environmental Data. The objective of obtaining environmental historical data is to aid in the evaluation of potential sources of significant contaminant loadings (e.g., point and non-point source stormwater/wastewater discharges, spills, and groundwater discharges) to the Study Area. The sources of potential significance that were researched include those that occurred during the industrialized past as well as current, ongoing contaminant loadings. These data were collected from environmental site investigations under a variety of state and federal environmental programs (e.g., Brownfield Cleanup Program, State Superfund Program, Voluntary Cleanup Program [VCP]) within the HDR Area. Additionally, information on use and storage of chemicals within the HDR Area was obtained to identify potential sources of these chemicals to the Study Area. Information on discharges to the Study Area or Study Area sewers by significant industrial users (SIUs) as well as information regarding SIU non-compliance was obtained to identify potential sources of chemicals to the Study Area. Typically industrial uses are regulated by the City of New York Industrial Pretreatment Program (IPP), which began in 1987. Reports of spills and releases within the HDR Area were obtained and are summarized herein. Collectively, this information and data furthers the effort to later quantify the loadings of such sources to the Study Area.

Physical Data. The objective of obtaining physical historical data is to aid in developing a higher level of understanding of the physical characteristics of the Study Area. These physical characteristics provide basic information to support many of the evaluations that will be performed during the RI/FS, including the hydrodynamic, sediment transport, and fate and transport models; evaluations of areas of sediment deposition and erosion; and identification of ecological habitats.

The types of data in this category include information on the hydrogeology, historical dredging, topography, landforms, filling to create land behind the bulkheads, bulkhead construction, changes in the configuration of Newtown Creek and its tributaries and changes in filled areas, past industrial operations, bridge and tunnel construction, groundwater use, monitoring well locations, pumping well locations, groundwater flow, aquifer parameters, surface water flow, pipe flows (including permitted industrial discharges, unknown discharges, combined sewer overflows, and storm sewer outfalls), models, wetlands, utilities, and hydrographic surveys. Also included in this category are data on the current and future uses of the Study Area, including the locations of docks, the frequency of barge traffic, and information on recreational water use, fishing, and crabbing. Physical data are needed to develop, evaluate, and ultimately quantify source loadings to the Study Area. For example, groundwater data will be needed for a groundwater model to aid in assessing COPC loading from groundwater sources.

Study Area Data. The objective of obtaining data collected in the Study Area is to compile relevant available site characterization data from historical investigations. Data related to the surface water and/or sediments have been collected for the Study Area over the past 100 years. These data have been obtained through a variety of regulatory programs and, where available, continue to expand the knowledge of the nature and extent of constituents in Study Area media, aid in the design of field programs, and provide relevant data for site characterization and CSM development.

NYCDEP and NYSDEC have collected sediment, water quality, and biological data in the Study Area. Sediment data have been collected by USEPA as part of the Environmental Site Investigation (ESI); and surface water, pore water, and sediment data have been collected as part of the Laurel Hill Operable Unit 6 (OU6) RI investigation (draft report submitted to NYSDEC). Data have also been collected for the flow characteristics and shoreline conditions of the Study Area and pipe discharges to the Study Area.

2.4 Results of the Historical Data Review

The results of the HDR at this point in time are presented in this report. Identified data gaps will carry over to the Phase 1 RI Interim Data Report and Work Plan Addendum. The

Phase1 RI Interim Data Report is being prepared prior to the midpoint of the Phase 1 RI Field Program. The report will include a summary of outcomes from this report (HDR information obtained up to that point in time) and will summarize the results of the surveys performed (bathymetric, side-scan sonar, and magnetic surveys; aerial photography survey; and shoreline assessment). Building on the weight of evidence approach used in this DAR, the Phase I RI Interim Data Report will identify locations where further sampling or characterization, consistent with the provisions of the RI/FS Work Plan and the AOC, will be proposed to evaluate if those locations are sources of significant loadings of COPCs to the Study Area. The purpose of identifying potential significant sources of COPCs is not to fully characterize or delineate contaminant sources in the upland areas located outside the Study Area; rather, it is to identify where such sources may contribute significant loadings of COPCs to the Study Area consistent with the Respondents' obligations under the RI/FS Work Plan. The locations and sites proposed for further evaluation will be specified in the Work Plan Addendum. Proposed work will be conducted in the second half of the Phase 1 RI Field Program following USEPA approval of these documents. Source loadings will also be evaluated during Phase 2 of the RI Field Program.

This DAR also includes a data gap analysis identifying where the collection of additional relevant data is needed to better understand the relationship between a potential COPC source to the Study Area and its impact on the Study Area.

3 HISTORICAL DATA CHARACTERIZATION AND USABILITY

Historical data are defined as data or information, including analytical data, collected outside of the Newtown Creek RI/FS process. Acceptance criteria for RI data are documented in the approved project Quality Assurance Project Plan (QAPP) and Field Sampling and Analysis Plan (FSAP).

The project Data Management Plan (DMP) (Anchor QEA 2011b) specifies that historical data will be reviewed for quality and appropriate usage through application of Minimum Data Acceptance Criteria (MDAC), Activity Specific Acceptance Criteria (ASAC), and related quality assurance codes.

Historical environmental data are subject to the following data quality issues (USEPA 1992):

- Data sources
- Sources from background or contaminated sites
- Data collection methods
- Analytical methods and detection limits
- Analytical data qualification and validation

3.1 Data Acceptance Criteria for Historical Analytical Data

3.1.1 Introduction

MDAC have been developed to determine if historical data are acceptable for use in the RI without additional review and signoff. MDAC established for historical data collected for this project include whether:

- Data are from a known, documented source (e.g., government agency, scholarly research article, other technical document)
- Data are from the original (primary) source, rather than quoted in a secondary source
- Data have adequate quality assurance documentation, such as identified collection and laboratory methods, information on parties collecting the data, locations, and purpose of data collection
- For laboratory analytical data:

- Data tables are available (i.e., not summary format) with laboratory reports and data validation information
- Standard, currently acceptable methods were used for data analysis
- Appropriate detection limits are achieved so that the data meet RI data quality objectives (DQOs)

3.1.2 Data Acceptance Criteria

Examples of historical analytical data include historical and contemporary analytical data reported under environmental regulatory programs, such as New York's State Pollution Discharge Elimination System program (SPDES) and Inactive Hazardous Waste Disposal Site (IHWDS; or state Superfund) program.

Historical analytical data usability will be evaluated with MDAC, considering the following entities of data:

1. Event
2. Location
3. Sample
4. Analytical result or measurement
5. Quality control/data validation

Criteria are defined for each of these entities.

3.1.2.1 Event Entity

Event MDAC 1. Documentation must be available that describes the sampling program or event, the methods used, the parties involved in sample collection.

Event MDAC 2. Collection methods must be clearly defined and be consistent with obtaining representative and quantitative information.

Event MDAC 3. Data must be representative of either historical source conditions or current conditions that affect the Study Area.

3.1.2.2 Location Entity

Location MDAC 1. Coordinates and a qualitative understanding of accuracy (i.e., knowledge of how the location was established or the method by which the coordinates were obtained) must be documented.

Location MDAC 2. The coordinate system must be fully documented.

Location MDAC 3. Knowledge of remedial actions or dredging (environmental or navigational) must be documented. The characterization of the nature and extent of contaminants for the RI or characterization of exposure for risk assessment can be aliased by such actions.

3.1.2.3 Sample Entity

Sample MDAC 1. Sample collection method and matrix must be documented. For example, a water sample must be identified as to whether it is surface water, pore water, or groundwater, and whether it is whole water or filtered (i.e., total versus dissolved fraction). Temporal or spatial compositing and sample volume must be identified. For tissue samples, tissue preparation must be documented.

Sample MDAC 2. Sample depths and, where applicable, start and end depths must be identified, for both water and sediment matrices.

Sample MDAC 3. Sample collection methods must be documented and consistent with approved methods, including holding time and preservation.

3.1.2.4 Result or Measurement Entity

Result MDAC 1. Analytes and units must be clearly identified. Constituent parameters must be identified for summations. Where possible, summations should be verified by recalculation from raw data.

Result MDAC 2. Detection limits, units for each detection limit, and data qualifiers must be reported. Non-detected results must have detection or reporting limits. Data qualifiers must follow USEPA guidance or be defined in documentation.

Result MDAC 3. Analytical methods must be documented and acceptable based on USEPA guidance. It is recommended that only results reported from USEPA-approved or standard methods be used for RI nature and extent or for risk assessment. Results based on older methods that have poor resolution of analytes or high detection limits may not be appropriate for comparison with results based on newer methods.

Result MDAC 4. Measurement instruments and calibration procedures must be documented.

Result MDAC 5. Toxicity and bioaccumulation test methods must be documented, including any deviations from standard protocols. For risk assessment, test methods must follow standard protocols, including controls and reference tests. Proper documentation to assess methods and statistical treatment must be available. Where possible, statistical results should be recalculated from the raw test data.

Result MDAC 6. Taxonomic data must be reported to the lowest practicable taxonomic level on a sample-specific basis, with scientific nomenclature. Taxonomic levels must be sufficient to assess relevant metrics for ecological risk assessment, such as feeding guilds, or stress-induced community compositional changes. Collection methods, sample preservation, and sample preparation methods must be documented.

Result MDAC 7. Biological community metric calculations must be defined and documented.

3.1.2.5 Quality Control and Data Validation (QC/DV) Entity

QC/DV MDAC 1. Documentation of field quality control samples (duplicates, blanks) must be present. Evidence must be present to document that field variability and/or contamination was assessed.

QC/DV MDAC 2. Analytical chemistry data must have been validated and qualified consistent with USEPA functional guidelines or USEPA Region 2 validation practices. The level of validation can be documented in a transmitted database or in accompanying reports.

QC/DV MDAC 3. Hard-copy laboratory data reports (e.g., Form 1 or Certificates of Analysis) must be available to verify that electronic or tabulated data were accurately transcribed or transmitted.

3.1.3 Data Usability Categories

Two categories of data usability (DU) for the RI and risk assessment are defined.

DU-1. The data set fulfills all of the MDAC.

Data sets in this category are acceptable for inclusion in project databases and for potential use in defining nature and extent of contamination in the RI and for calculations to support risk assessments (risk characterization). Each data set has sufficient information to assess its quality. Collection and preparation methods are known and acceptable in the Superfund regulatory framework. The location of the sample is known with sufficient accuracy to support the nature and extent of chemical constituents and to evaluate ecological and human health risk. The analytical results have sufficient information to judge data validity and qualifiers.

It should be noted that while data in this category are considered acceptable for project uses from the perspective of overall quality control and documentation, their appropriateness for specific analyses must be considered on a case-by-case basis. For example, these data were collected in 2003 through 2006. The age of these data must be considered in evaluating their appropriateness for characterizing nature and extent and for estimating exposure for risk assessment. In addition, these data were focused primarily in the vicinity of Maspeth Creek; this spatial distribution must be considered when developing spatial averages. It is necessary to evaluate the appropriateness of these data for each use in the RI and FS.

DU-2. The data set fulfills many of the MDAC in each of the categories.

Data sets in this category may be acceptable for selected uses (for example, screening level evaluations and conceptual site model development), but these data sets are not considered acceptable for nature and extent characterization or for risk characterization. Data in this category might have documentation of collection and analytical methods and may have data qualifiers, but, for example, may be missing detection limits or may not have documentation of data validation protocols. Thus, while these data may be sufficient to support gross spatial assessment, without full information, these data could not be used for nature and extent or risk characterization.

The RI Project Manager and the Risk Assessment Project Manager will make final decisions on the usability of data sets in this category.

3.2 Data Acceptance Criteria for Historical Information Other than Analytical Data

Many other documents of historical usage, such as land use, industrial practices, industrial incidents (e.g., spills, fires, and unintended discharges), news items, invoices, manifests, permits, and testimonies were collected during the HDR. Many of these documents were used to assist in the continued development of the Study Area's CSM. Evaluation of these documents contributed to the understanding of pathways from uplands to the Study Area and the timeline or duration of discharges or other sources of contamination.

Historical documents were assessed for their provenance (e.g., is the source known and is the document unaltered?) and their primacy (e.g., does the document contain primary source information, or is it summarizing information from other sources?). Documents were also evaluated for their specificity: are locations clearly identified? Are chemicals clearly identified? Are entities (people and companies) clearly identified?

During the historical data collection and review, these acceptance criteria were applied when making relevance determinations for inclusion of information contained in this DAR. Cited resource documents are identified in the text and listed in the bibliography (Section 10) of this DAR.

4 HISTORICAL DATA APPLICATION

This section presents a review of historical documentation including physical data, environmental data, and Study Area data (see Section 2.3 for discussion of data usability categories). Documentation such as this is used to continue the development of the CSM. Given the length of time that the area has been in industrial use (mid-1800s to present day) and the density of the urban industrial development within the historical Study Area, this section is not intended to provide a comprehensive history of the area. Instead, it presents an overview of the significant impacts and forces that have played a role in the evolution of Newtown Creek. Additional historical information is still being obtained and will be used in later reports, as necessary, to update the CSM through the RI/FS.

4.1 Physical Data

Physical data pertain to the physical setting of the Study Area and include descriptions of the natural setting (e.g., hydrogeology, topography, hydrology) and of anthropogenic activities with the potential to impact the physical setting (e.g., water use, dredging, infrastructure).

4.1.1 Reshaping Newtown Creek

Significant dredging and filling events and bulkhead construction have occurred in Newtown Creek, causing changes to its configuration, from the mid-1800s to the present day.

4.1.1.1 Creek Configuration and Tributaries

Changes in the historical configuration of Newtown Creek to present day conditions largely coincided with the industrialization of the area during the mid-1800s and early 1900s. The creek once flowed through wetlands and marshes and had a natural depth ranging from 4 to 12 feet (War Department 1916b). Historical maps depict Newtown Creek with natural side channels and islands including Mussel Island, which was a small mud flat approximately 159,300 square feet in area located opposite Maspeth Creek's mouth (MANY 1921). Figure 4-1 depicts historical Newtown Creek including Mussel Island circa 1844. Over time, Newtown Creek and its tributaries were channelized and dredged, and wetlands and marshes were filled, reworking the natural banks and creek into a controlled channel (AECOM 2011). Figures 4-2a through 4-2d depict changes in Newtown Creek's configuration over time.

In the mid-1800s, commercial and industrial development along Newtown Creek accelerated rapidly. This development brought increased boat and barge traffic to the creek including larger shipping vessels. Dredging in Newtown Creek and its tributaries began in the mid-1800s. By 1884, two canals, present day Whale Creek and the East Branch of Newtown Creek, had been cut into marshy edges of the waterway (NYSDOT and FHWA 2005). In 1890, English Kills was excavated by the City of Brooklyn under legislative authority of the State (War Department 1936b). In the early 1900s a 150-foot-wide channel and a turning basin were dredged in Dutch Kills, and approximately 2,400 feet of bulkhead was installed (NYSDOT and FHWA 2005). In 1914, portions of English Kills were dredged and bulkheaded, and several slips were created (War Department 1916b).

In the 1920s, the U.S. federal government appropriated funds necessary for the work of widening and deepening the channels of Newtown Creek and its tributaries to accommodate the booming industries along the creek. Bulkheading of the creek and its tributaries coAntinued, and by 1921, the entire lower 2.5 miles of waterfront and approximately one-half of the upper 1.5 miles were bulkheaded. Dutch Kills and Whale Creek were bulkheaded throughout approximately one-half of their course, and English Kills was bulkheaded throughout almost its entire length. Maspeth Creek was not bulkheaded (MANY 1921). By 1920, Newtown Creek had a mean lower low water (MLLW) navigation channel measuring 125 feet wide and 18 feet deep (MANY 1921).

By the 1930s, Newtown Creek's navigation channel depth increased to 23 feet MLLW and the width ranged from 100 to 250 feet (War Department 1936a). A turning basin was created at the mouth of Maspeth Creek with the removal of Mussel Island (NYSDOT and FHWA 2005). Maintenance dredging in Newtown Creek and its tributaries continued through the 1950s; however, the configuration of the creek largely remained the same (LISJ 1950; USACE 1973).

Today, the Newtown Creek shoreline and associated tributaries are almost entirely bulkheaded (War Department 1936a; URS 2000; NCA 2012). Bulkheads are generally timber, steel, cement, or riprap, as shown on Figure 4-3, and are in various states of disrepair (URS 2000). Some sections of the creek are not bulkheaded and eroded bank is present (Anchor QEA 2012).

4.1.1.2 Historical Dredging

Beginning in the late 1800s, the federal government funded dredging to deepen, widen, and maintain the navigational channel throughout Newtown Creek and its tributaries. Funds were allocated by congressional legislation for specific dredging projects and administered by the Secretary of War and the U.S. Army Corps of Engineers (USACE). In some cases, the dredging event occurred several years following the original allocation of funds and differed from the location or dimensions specified in the allocation. Specific USACE dredging events and selected dredging by property owners are described in detail in this section and summarized in Table 4-1. Significant features and landmarks referred to in this discussion are shown on Figure 4-4, which is a War Department United States Engineer Office (War Department) historical sketch providing details about planned dredging in English Kills.

4.1.1.2.1 Channel Dredging

The *Act Providing for Improvement of Newtown Creek* passed by the U.S. Congress on May 13, 1869, allocated funds for dredging Newtown Creek to a depth of 6 feet across its entire width and length (BPL 1870a). The River and Harbor Act (RHA) of 1884 provided appropriations to dredge a channel 10 feet deep from Vernon Avenue to Queens Oil works and a channel 21 feet deep and 60 feet wide from Vernon Avenue to the East River removing 83,850 cubic yards (BPL 1890). In 1897, the channel was deepened from 10 feet to 18 feet between Vernon Avenue and Queens Oil works, and 60,000 cubic yards was removed (BPL 1897). In 1915, the creek was dredged again, resulting in an18-foot-deep and 125-foot-wide channel extending from the confluence with the East River to Metropolitan Avenue (at English Kills). Approximately 294,887 cubic yards of material were removed (WDUSEO 1916b; 1928a).

The *RHA of March 2, 1919* (USACE 1973) provided appropriations for the following dredging activities:

- A channel in Newtown Creek 23 feet deep and 130 feet wide to 150 feet north of Maspeth Avenue
- A channel in the East branch of Newtown Creek 20 feet deep, 125 feet wide, and 2,000 feet long

- A channel in Dutch Kills, 20 feet deep, 75 to 100 feet wide (where practicable), and 2,800 feet long with a turning basin at the head
- A channel in Maspeth Creek, 20 feet deep 100 feet wide, and 2,000 feet long
- A channel in English Kills, 20 feet deep and 150 feet wide to the Metropolitan Avenue Bridge

The RHA of 1919 included the following stipulations:

> "no work shall be done in Dutch Kills until the obstructing bridges near its mouth are suitably modified; that no work shall be done in Maspeth Creek until its harbor lines have been approved by the Secretary of War and all questions of right of way have been satisfactorily met without expense to the United States, and that no work shall be done on the removal of Mussel Island or on widening the channel above that island or in English Kills until the necessary rights of way have been provided in each case without cost to the United States, and corresponding changes have been made in the existing harbor lines (War Department 1922)."

As a result of these stipulations, the dredging was delayed.

By September 1922, the Newtown Creek channel had been dredged to a width of 125 to 150 feet and a depth of 20 feet from the confluence with the East River to Hobson Avenue, as proposed in the RHA of 1919. Approximately 77,875 cubic yards of material were removed (War Department 1928a).

In 1923, a 20-foot-deep channel was dredged in Dutch Kills from the main channel in Newtown Creek to the turning basin. The turning basin was also dredged to a depth of 20 feet. The width of the dredged channel narrowed from 200 feet at Newtown Creek to 100 feet at the Long Island Railroad Bridge and the Hunter's Point Avenue Bridge to 75 feet at the base of the turning basin (War Department 1923a, 1923b).

In 1928, the Brooklyn Union Gas Company dredged a 20-foot-deep, 50 foot-wide, and 150-foot-long area directly adjacent to the western line of the channel creating a birthing spot for vessels and connecting the Newtown Creek and Maspeth Creek channels. Approximately

400,000 cubic yards of material including a portion of Mussel Island were removed (War Department 1928b).

In 1929, Newtown Creek and Maspeth Creek channels were dredged to the depths proposed in the RHA of 1919. Approximately 5,400 cubic yards of material were removed from Newtown Creek between Apollo Street and 100 feet west of the historical Meeker Avenue Bridge. Approximately 193,350 cubic yards of material were removed between Lombardy Street to the historical National Enameling and Stamping Company to create a channel 200 feet wide in Newtown Creek and 100 feet wide in Maspeth Creek (War Department 1929).

In 1930, the dredging of Newtown Creek and its tributaries as proposed in the RHA of 1919 was not yet complete. The Newtown Creek channel was 20 feet deep from the East River to 100 feet past Maspeth Avenue, 12 feet deep in the East Branch to Metropolitan Avenue, and 20 feet deep in Dutch Kills. Dredging to create a 20-foot depth within Maspeth Creek was in progress. The dredging of English Kills and the East Branch proposed in the RHA of 1919 had not been started (War Department 1930a).

The RHA of 1930 provided the following appropriations for dredging:

- A channel, 23 feet deep and 130 feet wide, from the East River to 150 feet north of Maspeth Avenue
- A triangular area at the entrance of the creek, 23 feet deep
- A turning basin, 23 feet deep, that required the removal of Mussel Island

In 1932, the Newtown Creek channel was dredged to a depth of 23 feet and 70 feet wide from 400 feet south of the Greenpoint Avenue Bridge to 100 feet north of the Meeker Avenue Bridge. Approximately 146,000 cubic yards of sediment were removed (War Department 1931a, 1932). By 1933, a 23-foot-deep and 100-foot-wide channel existed between the East River to Mussel Island (Stout 1935). By 1936, with the exception of the span between the Greenpoint Avenue Bridge and Meeker Avenue Bridge, the channel was expanded to a width of 130 feet (Robinson 1937).

A June 1936 allocation by the U.S. federal government funded the dredging in English Kills from Maspeth Avenue to the Metropolitan Avenue Bridge. Approximately 113,500 cubic

yards of sediment were removed to create a 16-foot-deep and 150-foot-wide channel (War Department 1937, 1941).

In 1945, funds for the dredging of the East Branch channel proposed in the RHA of 1919 were released. The proposed depth decreased from 20 feet (as specified in the RHA of 1919) to 18 feet from Maspeth Avenue to the Grand Street Bridge (War Department 1945).

4.1.1.2.2 Maintenance Dredging of Navigational Channels

Maintenance dredging performed to maintain the navigational channels included the following events:

- In 1907, dredging was proposed to restore the channel to 18 feet deep and 125 feet wide from the head of navigation to the Metropolitan Avenue Bridge (War Department 1907).
- In 1924, dredging was proposed to remove shoals interfering with navigation throughout Newtown Creek (War Department 1924).
- In 1933, an allocation of funds provided for dredging 533 cubic yards of ledge rock and 1,522 cubic yards of other material from the entrance channel, 3,000 cubic yards of material from the draw at the Greenpoint Avenue Bridge, and 3,800 cubic yards of rock and boulders from the East River to the Meeker Avenue Bridge (War Department 1933).
- In 1935, an allocation of funds provided for the removal of shoals in the Newtown Creek channel from the mouth to Maspeth Avenue (War Department 1935).
- In 1941 and 1946, appropriations provided for restoring the English Kills channel to 16 feet deep and 150 feet wide from the mouth to Metropolitan Ave (War Department 1941, 1946).
- In 1950, dredging to restore the Newtown Creek channel to 23 feet deep and 130 feet wide was completed with the exception of a 105-foot-wide span from 500 feet upstream of the Greenpoint Avenue Bridge to Meeker Avenue. Approximately 233,600 cubic yards of material were removed (LISJ 1950).

4.1.1.2.3 Maintenance Dredging at Berths and Docks

Maintenance dredging also occurred at berths and docks to provide for vessel access to these structures. Information regarding these instances is still being collected. A data gap has been identified for this information and is included in Section 8.

4.1.1.2.4 Disposal of Dredge Spoils

Prior to environmental regulations, dredge spoils were often disposed of on nearby upland areas or in the ocean. In 1922, an internal USACE memorandum regarding policy and specifications for proposed dredging on Dutch Kills and Maspeth Creek included the following specification for disposal of dredged materials:

> "Par. 34 Disposal of Excavated Material. – This paragraph is to follow the usual form, which provides for disposal of material at such localities as may be designated by the Supervisor of New York Harbor, or behind bulkheads in shoal waters or at the water's edge, or the contractor may provide his own dumping ground subject to the approval of the contracting officer" (Rostock 1922).

By the 1960s, maintenance dredge spoils were typically combined with materials from other locations and disposed of in the New York Bight (USACE 1973).

Beginning in the 1970s, feasibility studies conducted for proposed dredging in Newtown Creek concluded that disposal options for dredged materials were severely limited due to the concentrations of contaminants in the sediments (NYDCEP 2000; USACE 1975; Greeley 2009). Given the difficulty and expense involved, dredging activities on Newtown Creek have decreased significantly since the 1970s. In 2009, NYCDEP conducted sediment sampling in preparation for maintenance dredging at the mouth of Newtown Creek and at Whale Creek to allow access for sludge barges (NYCDEP 2009).

A discussion of upland fill in areas near or adjacent to the creek is included in Section 4.1.1.4.

4.1.1.3 Bulkhead Construction

The majority of the bulkheads on Newtown Creek and associated waterways were constructed between the late 1870s and early 1930s. The 8,700 feet of timber bulkheads in English Kills were built between 1873 and 1881 (War Department 1936a). By 1900, most of Newtown Creek was bulkheaded. Undeveloped sections without bulkheads included Dutch Kills, 3,000 feet of shoreline along the Queens side of Newtown Creek, and 3,500 feet of shoreline along the Brooklyn site of Newtown Creek downstream of Maspeth Avenue. Dutch Kills and the Queens side of Newtown Creek upstream of Dutch Kills were developed circa 1905 through 1912, and 2,400 feet of bulkhead were constructed. In the 1920s and 1930s, 80 to 85 active waterfront properties existed along the waterway's 9.6 miles of bulkheads (NYSDOT and FHWA 2005).

A survey of Newtown Creek by the War Department in 1936 described bulkheads constructed of timber cribs with the base of the cribbing at a depth of 10 feet below MLLW that had been in place for approximately 30 to 40 years. Representative cross-sections are shown in Figure 4-5, which is an historical Office of the Chief of Engineers sketch depicting alternatives for bulkhead repair in 1930. The width between bulkheads in the main channel and in English Kills was estimated to be 250 feet and 160 feet, respectively. The depth of water along the bulkheads varied from about 3 to 11 feet at MLLW. The report documented 96 bulkhead terminals along Newtown Creek in 1936 (War Department 1936a).

In 1965, the Port of New York released a report that included data on the piers, wharves, and docks located in Newtown Creek and associated waterways. Details of bulkhead construction (e.g., materials, dimensions, etc.) at each property on the creek were described. The majority of the bulkheads were constructed from timber; however, concrete and steel sheetpile bulkheads were also noted (USACE 1965a).

During the 1990s and 2000s, many property owners replaced the bulkheads along their sites' shorelines due to deterioration of the timber crib bulkheads. The replacements typically included the installation of steel sheetpiles with or without anchors seaward of existing timber cribs or the addition of riprap to stabilize the shoreline (NYSDOT and FHWA 2005; AECOM 2011). Bulkhead materials were documented during an Anchor QEA 2011 survey

and are shown on Figure 4-3. This shoreline survey effort performed by Anchor QEA is discussed further in the Interim Data Report (Anchor QEA 2012).

4.1.1.4 Upland Fill

Artificial filling of areas along Newtown Creek and its tributaries was initiated early in the industrial development of the area and continued to fairly recent times. No comprehensive summary of the placement of historical fill for eastern Long Island or the area surrounding Newtown Creek was identified for review during the HDR process. Provisions exist within NYSDEC guidance for investigating historical fill during the remedial investigation of a property (see Section 3.11 of DER-10 Technical Guidance for Site Investigation and Remediation; NYSDEC 2010). This evaluation was either not completed or the results were not available or found for review for the sites summarized in this document.

Historical U.S. Geological Survey (USGS) topographic maps provide evidence of the extent of historical fill placement in the vicinity of the creek. Figures 4-6a through 4-6e illustrate the development and filling of the area surrounding the creek. The 1898 map (see Figure 4-6a) shows the area prior to industrialization. The tributaries shown in the 1898 map are, for the most part, surrounded by wetlands and extend beyond their current limits. By 1947, many changes in the creek and uplands had become evident (see Figure 4-6b). The low-lying area north of Dutch Kills and areas near Maspeth Creek labeled "Linden Hill" had been filled. The Long Island Rail Road (LIRR) docking slips on the current Hugo Neu property are present. In 1956, Maspeth Creek appears to be shorter and the docking slips at the Hugo Neu property are still present (see Figure 4-6c). The docking inlets no longer appear in the 1967 or 1979 maps, but no additional significant fill areas are evident on these maps (see Figures 4-6d and 4-6e).

The origin and composition of specific fill locations on Newtown Creek have not been consistently documented. Historical fill sources are likely to include various materials, such as private and municipal trash, ash generated by burning trash, industrial waste, and dredge spoils from the creek (BPL 1896b, 1899; Rostock 1922, USEPA 2003).

Subsurface soil investigations at upland sites indicate widespread but discontinuous instances of fill within the HDR Area. Instances of fill material and location identified from readily available documentation at individual upland sites or discrete geographical areas include the following:

- In 1895, NYC issued a permit to Maurice Fitzgerald for "fill in lots adjoining Long Island railroad tracks in the Second Ward of Long Island City with New York City refuse, garbage excepted, from the wharves of the department of cleaning." In April 1896, the local newspaper reported that the street cleaning department of NYC was unloading 2,000 tons of garbage per day on land near Dutch Kills (BPL 1896a, 1896b).
- A free, public dump was located at the foot of Humbolt Street (Whale Creek) and occupied approximately 15 blocks (BPL 1899).
- Between 1966 and 1970, docking inlets at the Long Island Railroad freight yard located at the confluence of Dutch Kills and Newtown Creek in Queens were filled to create the current footprint of the property (Sanborn 1970, 1979b).
- Large volumes of fill were used to fill reclaimed marshland and for construction of elevated LIRR right-of-way and bulkheaded areas at the Amtrack Sunnyside Yard. Fill at the site includes reworked glacial deposits (unstratified sand, silt, clay, and gravel), railroad ballast (including cinders/ash), and minor amounts of construction debris (brick and wood; Roux 2009).
- Large volumes of fill were used, with a maximum thickness of 20 ft. noted, to reclaim land at located at the present-day ExxonMobil Greenpoint Petroleum Remediation Project. Fill at the site was identified as varying amounts of sand, gravel, silt, cobbles, brick, cinders, wood, metal, ash, concrete and glass and was thickest in areas where historic marshlands were filled in (see ExxonMobil Greenpoint Petroleum remediation Project site summary in Appendix C).
- Large volumes of fill were used to reclaim land at the present-day Greenpoint Energy Site. The fill was observed between 30 to 40 ft. thick near the creek and only 10 to 15 ft. thick in the upland portion of the site. The fill appears to have filled in historic marshland and creek channels (see Greenpoint Energy Center Site Summary in Appendix C).

4.1.2 Land Use, Creek Use and Infrastructure

Significant changes have occurred in the use of Newtown Creek and the surrounding uplands since the mid-1800s, and the development of the area has been influenced by public health, environmental, and land use regulations.

4.1.2.1 Pre-industrial Uses

Historical records indicate that the Newtown Creek area was inhabited by the Mispat Tribe in the early 17th century. In 1613, the Dutch explored and surveyed Newtown Creek, subsequently acquiring the area from the local Mispat tribe. By the mid-1600s, the area was primarily occupied by farmsteads and small agrarian villages. Newtown Creek was used for local travel by settlers and Native Americans who used the waterway to travel between the East River and a historical village site near Maspeth (NCA 2012). By the mid-1800s, farms and plantations lined the shores of the creek (NYSDOT and FHWA 2005; NCA 2012). In 1850, an upland area at the mouth of Newtown Creek known as Hunter's Point was subdivided. Adjacent marshes were filled, and bulkheads were constructed (NYSDOT and FHWA 2005).

4.1.2.2 Ports and Navigation

Due to limited road development and bridge crossings on Newtown Creek, water transport was viewed as the better way to transport goods and people among local villages and nearby urban areas through the 1860s. Though not well documented, vessels using the waterway likely consisted of smaller sailing vessels and steamboats, towed barges, schooners, other sailing vessels, and lighters (NYSDOT and FHWA 2005).

During the 1840s through 1860s, hundreds of ships were also built at shipyards, primarily along the navigable lower portion of the Creek. In 1859, boat construction was expanded beyond wooden boats to include steel-plated steamboats and other ships at the Continental Iron Works facilities (Eddey 1999).

In the 1850s and 1860s, petroleum refining industries began locating along the creek, further transforming Newtown Creek into an industrial waterway. Shipping vessels brought in crude petroleum and shipped out refined petroleum products such as kerosene. This practice

continued even after the establishment of the Standard Oil pipeline from Pennsylvania to Brooklyn, with a branch line running under Newtown Creek (NYSDOT and FHWA 2005).

Between 1880 and 1900, channel improvements, improved adjacent street networks, and the availability of rail and lighterage service supported further waterway industrialization, including chemical, animal byproduct, fertilizer, and metal processing plants. During this time, petroleum product delivery changed from wooden vessels carrying barrels or tin cans to transport by steel oil tankers (NYSDOT and FHWA 2005).

Newtown Creek was almost entirely bulkheaded by 1900 with waterway expansions. Bulk marine shipments of coal, lumber, sand, gravel, and other building materials increased to support the population growth and associated residential development surrounding the industrial development (NYSDOT and FHWA 2005).

As late 19th century industrialization occurred, the number, variety, and size of vessels using Newtown Creek increased. The estimated number of two-way vessel trips circa 1890 was 4,500. This number grew to more than 15,000 in 1900 and more than 28,000 in 1917 (NYSDOT and FHWA 2005).

Additional waterway development in the early 20th century accompanied further industrial development. Large barges, steamers, sailing vessels, and carfloats used the waterway. Towing services also began circa 1900 to address shallow depths and bridge height constraints (NYSDOT and FHWA 2005).

By 1910, Newtown Creek and its tributaries constituted the busiest waterway of its size in the world, with 65 to 70 industrial businesses receiving and shipping petroleum, chemicals, coal, and building products. A 1,000-acre rail and marine terminal was constructed on Newtown Creek east of Dutch Kills circa 1907, with several short piers to handle heavy freight. Peak activity circa 1916 included 5.9 million short tons moved through the waterway. Additional navigation improvements to the waterway occurred in the 1920s and 1930s, increasing raw materials shipped in and manufactured products shipped out. These improvements supported sugar refineries, hide tanning plants, canneries, copper wiring plants, and petroleum and oil refineries (NYSDOT and FHWA 2005).

Between 1945 and 1965, waterfront users dropped by approximately 50 percent due to an overall decline in manufacturing facilities and a shift to materials handling, and improved highway access into the industrial area. Associated marine cargo shipments also declined during this time period. In the 1950s, there were 8.9 million short tons handled. In the 1960s, this further declined to 5 million tons. This decline continued to the present, with marine cargo in and out of Newtown Creek dropping from 5 million tons in the 1960s to 1 to 1.5 million tons in the late 1990s and early 2000s (NYSDOT and FHWA 2005).

The following is a brief summary of waterway shipment activity by various products in the 20th century (NYSDOT and FHWA 2005):

- Petroleum products – Circa 1935 to 1950, local delivery of oil products accounted for an increasingly larger percentage of tonnage handled on the waterway until a precipitous decline in the 1950s and 1960s, when processing ended and transport increased by pipeline and truck as associated infrastructure developments occurred.
- Bulk marine products – Significant shipping of coal, lumber, sand, gravel, brick, and other building materials, along with ice.
- Municipal waste shipments – These shipments began in 1920 with the establishment of a small ash dump east of Whale Creek, and evolved into a marine transfer station for municipal waste. The site remained active until around 2001.
- Other products – Raw materials and finished products related to sugar refineries and hide tanning plants, canneries, and copper wiring plants.
- Several derrick boats with booms also operated and, in some cases, continue to operate, on the waterway, including A-frame heavy lift rigs and barge-mounted marine or ringer cranes.

As of 2005, there were 13 active marine facilities in operation along the waterway. This number includes petroleum companies, concrete plants, and scrap metal yards. Since the early 1990s, marine traffic upstream of mile 0.5 has been primarily tug and barge traffic, with a small number of self-propelled costal tankers. Waste Management of New York also owns several properties and in the future may pursue waste management activities that could involve shipping along the waterway (NYSDOT and FHWA 2005).

4.1.2.3 Creek Crossings (Bridges, Tunnels, Pipelines and Marine Cables)

The first likely bridge crossing Newtown Creek was a wooden bridge near the present location of Meeker Avenue, which was in place by 1670 (NYSDOT and FHWA 2005). The wooden bridge was replaced in 1812 to 1814 by the Penny Bridge, a toll-bridge on the Newtown and Bushwick Turnpike Road. The first crossing of English Kills was constructed circa 1814 to 1816 along the present Metropolitan Avenue as part of the Williamsburg and Jamaica Turnpike. Other 19th century-constructed bridges included the Maspeth Avenue Plank Road to Newtown bridge in 1846 and the Greenpoint and Flushing Plank Road bridge in 1853 to 1854. Two bridges were constructed as part of local road development in the late 1860s, over Newtown Creek at Vernon Avenue and Dutch Kills on present Borden Avenue. The first railroad crossing over Newtown Creek, a swing bridge, was constructed in 1861 (NYSDOT and FHWA 2005). Nine additional bridges were constructed in the 20th century, including swing, fixed, bascule, and retractile styles (NYSDOT and FHWA 2005). Historical and current bridges over Newtown Creek and its tributaries are summarized in Table 4-2.

Tunnels, pipelines, and marine cables cross under Newtown Creek. The Standard Oil pipeline was constructed under Newtown Creek in 1879, associated with the petroleum industry expansion in the area. Buckeye pipeline is an underground petroleum pipeline that transmits petroleum products from Linden, New Jersey, across Staten Island, under the New York Harbor and into Brooklyn and Queens (NYSDOT and FHWA 2005). A subway tunnel was constructed in the early 20th century, under the lower portion of the waterway. A 1936 Department of War report and a USACE 1985 EIS list 15 pipelines, 15 marine cables, and one tunnel cross Newtown Creek in different locations (War Department 1936a; USACE 1985).

4.1.2.4 Land Use Regulation and Zoning

Industrial development along Newtown Creek accelerated rapidly during the late 1800s. (NYSDOT and FHWA 2005). A tremendous growth in the population of nearby residential areas accompanied the commercial and industrial development (NYSDOT and FHWA 2005). In 1916, NYC adopted the Building Zoning Resolution. The resolution established three classes of Use Districts: residential, business, and unrestricted. Newtown Creek was classified as an unrestricted district, and therefore, any new facility engaged in any trade, industry, and use was allowed to operate along Newtown Creek. Uses allowed on Newtown Creek (but

prohibited from residential and business districts) included asphalt manufacture or refining; boiler making; brewing or distilling of liquors; distillation of coal, wood, or bones; dyeing or dry cleaning; operating an electric central station power plant; fat rendering; fertilizer manufacture; gas (illuminating or heating); incineration of garbage, offal, dead animals, or refuse; iron, steel, brass, or copper works; lime, cement, or plaster of Paris manufacture; paint, oil varnish, or turpentine manufacture; petroleum refining or storage; printing ink manufacture; operating a saw or planning mill; sugar refining; tallow, grease, or lard manufacture and refining; and tar distillation and manufacture (NYC 1916). Figures 4-7 and 4-8 depict industrial and residential development surrounding Newtown Creek in the early 1920s (MANY 1921).

In the 1920s and 1930s, the industrialized land bordering on Newtown Creek and its tributaries, referred to as the "Newtown Creek Industrial District," comprised a section approximately 3.5 miles long and from 0.25 to 0.75 mile wide, and included 80 to 85 active waterfront properties (MANY 1921; NYSDOT and FHWA 2005). During this time, a large portion of the eastern end of the industrial district, located near the geographical center of New York City, was still entirely undeveloped with more than 550 acres of undeveloped land still existing directly on or near the creek (MANY 1921). By 1936, the Newtown Creek area was well served by highways and railroads, and was extensively developed with commercial, industrial, and manufacturing uses (War Department 1936a).

By 1960, the 1916 zoning ordinance had been amended several times and included nine use districts. Newtown Creek remained an unrestricted area (NYCDCP 1960). In 1961, NYC zoning ordinances were revised. Areas adjacent to Newtown Creek were designated as M3 Heavy Manufacturing Districts. These districts were characterized as "designed to accommodate the more essential heavy industrial uses which involve more objectionable influences and hazards, and which, therefore cannot reasonably be expected to conform to those performance standards which are appropriate for most other types of industrial development" (NYCDCP 1961).

There have been few significant changes in land use near the creek since the 1960s. Pockets of mixed-use, commercial, and residential development exist; however, the predominant land use in the Newtown Creek area remains industrial (NYC 2011). The majority of the

water frontage is developed for terminal and industrial purposes and occupied by large-lot, truck-dependent, heavy industrial operations (NYSDOT and FHWA 2005; NCBOA 2012). A generalized 2012 zoning map of the Newtown Creek area is presented as Figure 4-9.

While the broad use categories have not changed since the 1960s, additional regulations (e.g., overlays) have been incorporated into the zoning ordinances and apply to Newtown Creek and surrounding neighborhoods. Overlaying economic development designations for the Newtown Creek area include the East Williamsburg, North Brooklyn and Maspeth Industrial Business Zones (NYC) and the Brooklyn Navy Yard/East Williamsburg Empire Zone program (New York State) (NCBOA 2012).

Newtown Creek is located within the New York State Coastal Zone. Developed in 1982, the Coastal Zone boundary encompasses New York State land and water of direct and significant impact on coastal waters (NYCDCP 2012). The Coastal Zone was developed as a component to New York State's Coastal Management Program, designed to balance economic development and preservation by promoting waterfront revitalization and water-dependent uses while protecting fish and wildlife, open space and scenic areas, and public access to the shoreline (NOAA and NYSDOS 1982). The New York State Department of State (NYSDOS) administers the program at the state level, and the NYC Department of City Planning (NYCDCP) administers it at the city level (NYCDEP 2003d).

Within the Coastal Zone designation, Newtown Creek is designated one of six NYC SMIAs (NCBOA 2012). SMIA designations were first developed by NYC in their 1992 Comprehensive Waterfront Plan (NYC 2011). These designations, typically characterized by clusters of industrial firms and water-dependent businesses, were intended to protect and encourage concentrated working waterfront uses. The Newtown Creek SMIA is the largest of the six SMIAs, encompassing approximately 780 acres (NYC 2011). See Figure 4-10 for the Newtown Creek SMIA designation.

The tidal waters of greater New York City including Newtown Creek are located within the Interstate Environmental District (IED) which is regulated by the Interstate Environmental Commission (IEC). The name of the organization was changed to the Interstate Environmental Commission (IEC) in 2000. The Interstate Sanitation Commission and the

Commission's district were established by the Tri-state Compact[1] (Title 5, §21-0501; ONECLE 2012) which had been ratified by New York, New Jersey and Connecticut by 1941. The Commission is responsible for assuring compliance with and enforcement of its Water Quality Regulations within the IED (IEC 2012). Section 4.1.3.4 further discusses this classification.

4.1.2.5 Industrial Uses and Operations

Industrial operations located on and near Newtown Creek were well documented in survey reports conducted by the U.S. War Department (also known as the U.S. Army Corps of Engineers), and articles published in the New York Times and Brooklyn Eagle in the late 1800s and early 1900s. Prominent industries located on and near the creek between 1880 and 2007 are summarized as follows:

- 1884 – Oil works, soda works, boat and coal yard, box factory, boiler works, coal elevator, sugar refinery, lumber yard, planning mill, fertilizers, chemical works (BPL 1884)
- 1894 – Oil refineries, chemical works, fertilizer works, coal, ice, lumber, brick (NYT 1896)
- 1912 – General merchandise, copper and products, coal and other fuel, building and road building material, manufacturers, farm products (BPL 1912)
- 1921 – Asphalt, building and construction materials, drugs and chemicals, foods and confectionary, clay products and glassware, fuels and petroleum, metals and metal products, shipbuilding and repair, smelting and refining, textiles and allied products, vehicles and accessories, paper products, printing and lithography, paints and varnishes (MANY 1921)
- 1936 – Oil storage and manufacturing, lumber, building materials, illuminating gas works, copper refining, coal, asphalt-mixing, jute and fiber mill, textiles, sugar refinery (War Department 1936a)

[1] As first entered into pursuant to Chapter 4 of the Laws of 1936, as reenacted by Chapter 476 of the Laws of 1961, and as amended by Chapter 1046 of the Laws of 1969, and hereby continued (ONECLE 2012).

- 1940 – Oil storage and refining, coal, lumber, junk, brick, gravel, cement, rendering fats, soap, street car terminal, gas works, railroad yard, glass works, asphalt, bone meal, enamel, sugar refineries, copper smelting plans, copper refinery, lumber creosoting works (Federal Works Agency 1940)
- 1950 – coal, coke, lumber, petroleum product, copper, bronze, brass, brick, cement, iron and steel products, paint, animal products, sand, gravel and crushed stone (LISJ 1950)
- 1958 – Bulk materials including lumber, coal, sand gravel, and stone, manufacture of petroleum products and chemicals (LISJ 1958)
- 1976 – Oil storage and refining plants, lumber yards, building–materials yards, illuminating gas works, copper refinery, asphalt mixing plants, jute and fiber mill, sugar refinery (USACE 1973)
- 1987 – Electroplating, metal finishing, pharmaceutical manufacturing, industrial launderer, textile dyer, photofinisher, paint/ink formulator, steel drum reconditioning, adhesives and sealants, soap and other detergents, jewelry and precious metal, plastic molding and forming, metals molding and casting, copper forming, iron and steel manufacturing, electrical and electronic components, pesticide chemicals (NYCDEP 1987)
- 1995 – Electroplating, metal finishing, pharmaceutical manufacturing, industrial launderer, textile dyer, photoengraver, paint/ink formulator, steel drum reconditioning, metals molding and casting, fur dresser and dyer, soap and other detergents (NYCDEP 1995, 1996)
- 2007 – Electroplating, metal finishing, pharmaceutical manufacturing, industrial launderer, textile dyer, photofinisher, paint/ink formulator, steel drum reconditioning (NYCDEP 2007d)

Newtown Creek was an attractive location for manufacturers because it was close to international ports and population centers but offered more space and less regulation than similar districts in the city (MANY 1921; Brooklyn Chamber of Commerce 1923). A brochure published by the Brooklyn Chamber of Commerce in 1923 noted that dozens of acres ideal for heavy industry and subject to few restrictions located close to a plentiful supply of labor and transportation facilities for heavy freight were available in the Newtown Creek industrial district (Brooklyn Chamber of Commerce 1923). As additional

manufacturing facilities and storage yards were built along the creek, more raw materials needed for manufacturing processes (e.g., synthetic chemicals, oil, lumber, coal, etc.) were available. Locating a business on Newtown Creek allowed manufacturers to minimize the costs associated with transporting both their raw materials and finished goods (Hurley 1994).

4.1.2.5.1 An Integrated Industrial District

By the late 1800s, Newtown Creek had become an integrated industrial district in which raw materials and finished products were readily transferred from one facility to another (Hurley 1994). This integration was illustrated by the journalist Ida Tarbell in her description of operations at a cannery located on Newtown Creek in 1904,

> "The oil runs to the canning works, and, as the new-made cans come down by chute from the works above, where they have just been finished, they are filled, twelve at time, with the oil made a few miles away….The cans are placed at once in wooden boxes standing ready, and, after a twenty-four-hour wait for discovering leaks, are nailed up and carted to a near-by door. The door opens on the river, and there at the anchor by the side of the factory is a vessel charted for South America or China or where not – waiting to receive the cans which a little more than twenty-four hours before were tin sheet lying in flat boxes" (Tarbell 1904).

4.1.2.5.2 Oil Refining

Petroleum refineries were at the center of the Newtown Creek industrial district (Hurley 1994). The first kerosene refinery began operating on Newtown Creek in 1854 (Camden and Welch 1883). By 1883, 50 refineries were operating on the creek (NYCDCP 1981). Petroleum distillates were essential ingredients for paint, varnish, and dye manufacturing (Hornix 1992; Regional Survey 1924). Fertilizer manufacturers used residual sludge from the refining process (BPL 1886; Baker and Kent 1887). Chemical manufacturers produced chemicals used in the refining process. Foundries, smelters, and metal works produced materials and equipment needed by the refineries, such as stills and tanks (Hurley 1994).

While specific operations likely varied depending on the time period, desired product, and facility, the basic distillation process was as follows. Crude oil was delivered to the refineries

via pipelines, barges, tankers, or rail cars. Once on site, crude oil was boiled in stills. As the temperature was raised, distillation products (e.g. naptha, kerosene, gasoline, fuel oils, lubricating oils) were boiled off one at a time according to their physical properties, and then condensed and captured (Haney 1923). After the volatile distillates boiled off, a residual tar was left in the still. This residual was sometimes mixed with coal dust and burned as a fuel to heat the stills, resulting in large amounts of black smoke. In other cases, it was processed and sold as lubricating oil, paraffin wax, fertilizer, and asphalt (BPL 1886; Baker and Kent 1887).

In the late 1800s, crude oil was primarily refined into kerosene, which was widely used in lamps and stoves. Following distillation, refineries typically treated the kerosene to improve the color and odor and to remove the more volatile constituents, resulting in a less flammable and dangerous final product. The treating process involved mixing kerosene and concentrated sulfuric acid in an agitator. The lighter kerosene was removed, leaving a heavy residual substance known as sludge acid. (Disposal of the sludge acid is discussed later in this section.) The kerosene was further treated with soda and then washed with large amounts of water. The wash water was typically routed through a series of traps to reclaim residual oil and then discharged to Newtown Creek (BPL 1886; Baker and Kent 1887; Hurley 1994).

4.1.2.5.3 Manufactured Gas

Manufactured gas plants produced gas from coal, or other organic materials. In the first half of the nineteenth century MGPs primarily used bituminous coal to produce illuminating gas for use in municipal lighting (Moore Binder 1955; NYSDEC 2012j). By the late 1800s, gas was a widely used fuel. By the 1950 and 1960s, as electricity and natural gas became available to more consumers, the majority of MGPs had ceased production (NYSDEC 2012j; Murphy et al. 2005; Hamper 2006).

In general terms, production of manufactured gas involved production of gas, purification of gas, handling of tars and oil by-products and handling of emulsions when tars and oils did not fully separate. Impurities including water vapor, tar, naphthalene, and hydrogen sulfide were removed prior to sale. By-products included tars, oils and wastewater. Specific techniques (e.g. coal carbonization or gasification) and processes (e.g. carbureted water gas

(CWG), oil gas, retort coal gas and by-product coke oven gas) employed at a plant were likely to change over time as technologies evolved and the availability of feedstock fluctuated (NYSDEC 2021j; Hamper 2006).

The carbonization process involved heating coal (or other organic solids or liquid feedstock) in retorts or coke ovens. The gases from the ovens were collected and purified to produce gas. By-products of this process could include ammonia, cyanide and phenolic compounds. The carbureted water gas (CWG) or water gas process was introduced in 1870 and was widely used in the U.S. (Matthews 1987; Murphy et al. 2005; Hamper 2006). In the CWG process, coke (or other feedstock) was heated in a generator, petroleum oils and steam were added in a carburetor and completed in a super heater. Tar-oil-water emulsions were a by-product of CWG process (Murphy et al. 2005). By -products of the gasification process included coal tar, light oil, coke and ammonia liquor. In some cases, these materials were sold for use by other industries. In other cases, they were disposed of as wastes (Murphy et al. 2005).

4.1.2.5.4 Fertilizer Manufacturing and Fat Rendering

Specific operations associated with these industries included bone boiling, bone burning, scrap drying, grease extraction, and bone grinding. These operations did not always occur at the same facility. Smaller facilities often performed one operation in the process and sold the product to another facility for additional processing. For example, bone black produced by burning bones was purchased and used by the sugar refineries. The fumes from bone burning were captured and condensed to produce sulfate of ammonia, which was used in the manufacture of fertilizers (BPL 1893).

Raw materials for these operations included green bones, which were collected from butchers' scraps and garbage in New York City and conveyed to the factories in covered wagons. On site, bones were boiled in open kettles and washed and dried in revolving cylinders to remove any material remaining on the bone or scrap. Scrap was stored in piles until it was needed (BPL 1890).

Manufacture of super phosphate fertilizers involved the use of sulfuric acid to decompose phosphoric rock to produce phosphate. Fumes generated from this process were routed through running water in a lead sleeve and then discharged to Newtown Creek. Some facilities purchased sludge acid from oil refineries for this purpose, while others obtained sulfuric acid from chemical manufacturers. At the Read Fertilizer Co., sulfuric acid was pumped from the tanks at the manufacturer (Nichols & Co.) directly into the upper stories of the fertilizer factory (BPL 1893).

4.1.2.5.5 Varnish, Paints, and Dyes

The primary raw materials for paint were oil and dry colors (Regional Survey 1924). Paints also contained heavy metals including lead, zinc, iron, and chromium (Bradshaw 1890). Coal tar dyes were manufactured by treating the heavy distillation fraction of coal tar (which contains phenol) with nitric acid. Benzene, methanol, nitrobenzene, and anthracene (derived from coal tar) were also essential ingredients in dye manufacture (Hornix 1992).

4.1.2.5.6 Metal Production and Metal Works

Copper smelting and refining within the Newtown Creek industrial area commenced near the turn of the 20th century. Feedstock consisted mainly of ore concentrates. The copper smelting process involved high temperature treatment in furnaces and converter vessels to separate the copper from impurities. The copper from the smelter was further purified by the refining process, which used fire refining in furnaces or electrolytic refining in tanks of copper sulfide and sulfuric acid. The resulting pure copper then was cast or shaped as desired. Used solutions from the electrolytic refining process were used to produce commercial products, such as copper sulfate. Copper smelting was discontinued by the early 1960s and copper refining and associated operations were discontinued by the early 1980s.

In 1942, a 90-acre aluminum reduction plant was constructed at the junction of the East Branch of Newtown Creek and Maspeth Creek. The plant was designed to produce an estimated output of 130,000 tons per year of aluminum. The plant utilized the typical technology of its day to produce aluminum from bauxite ores using an electrolytic process in eight potlines housed in 16 buildings on the site. The plant also produced various alloys of aluminum and other metals during its tenure. The plant was placed on standby on May 31,

1944, but resumed operations in September 1944 and operated continuously until it was finally closed in October 1959.

The Newtown Creek industrial area also was home to many other metals-related industries. Metal fabricating, metal products manufacturing and metal plating businesses operated in the Newtown Creek industrial area as early as 1902. A copper and aluminum wire manufacturing facility operated from 1968 until 1982. An aluminum finishing facility opened in 2002 and continues to operate today. Its business includes the cleaning, etching, phosphating, and powder coating of aluminum pieces. Metal finishing and plating operations also occurred at a number of facilities throughout the 20th Century. These businesses included nickel, chromium, silver, gold, tin, cadmium and copper plating; nickel and chromium stripping; acid and alkaline cleaning; acid pickling; electro cleaning; and polishing. A precious-metals recovery business opened in the 1980s and continues to operate today. Scrap metal and recycling businesses also have operated in the Newtown Creek industrial area. From the 1970s until the present, these businesses have received and processed residential metal recycling, scrap steel, and processed steel from the World Trade Center.

4.1.2.5.7 Incinerators

Historical refuse incinerators (also known as destructors and municipal waste combustors) operated within the HDR area from the early 1900s to the 1990s. In 1929, a refuse incinerator opened at the foot of Apollo Street in Brooklyn adjacent to Newtown Creek. The facility was operated by the Brooklyn Ash Removal Company until the 1930s (NYCDOS 1930). In 1959, the facility on Apollo Street was replaced by a new facility located at Kingsland Avenue in Brooklyn, adjacent to Newtown Creek, which continued to operate until 1994 (NYCDOS 1956, 1959). Although the Apollo Street and Kingsland Avenue facilities are often referred to as the Greenpoint incinerator in historical documentation, they were two separate facilities. The 1959 New York City Department of Sanitation Annual Reports refers to the Apollo Street facility as the "old Greenpoint incinerator" and the Kingsland Avenue facility as the "new Greenpoint incinerator." The Betts Avenue facility, located at 58-73 53rd Avenue in Queens, originally opened in 1926 and ceased operations in 1938. Following extensive renovations, the facility reopened in 1950 and operated until

1993. The Maspeth incinerator, located at Flushing and Metropolitan Avenue in Queens, opened in 1916 and was closed in 1937 (NYCDOS 1930; Walsh et al. 2001).

Generally, historical incinerator operations involved receipt of refuse at the facility (transported by wagon, truck, or barge), sorting, shredding, incinerating, quenching of burning residue, and disposing of ash (Samson 1951; Walsh 2001). Ashes were often sent to landfills or sold for construction-related uses, including the manufacture of cinder blocks (Zarin 1987; NYCDOS 1953).

The equipment and capacity at the incinerator facilities varied over the years. In 1930, the Greenpoint incinerator could burn 500 tons of refuse per day in four furnaces (Hiler furnace type). The Betts Avenue facility had a capacity of 225 tons per day, three furnaces (DeCarie furnace type), steam-driven auxiliaries, electric hoist, and a tractor loader. The Maspeth facility included two furnaces (DeCarie furnace type), 100 tons per day, steam-driven auxiliaries, and one universal crane (NYCDOS 1930).

In 1953, the Greenpoint incinerator bulkhead, operating at the foot of Apollo Street, included a reinforced concrete dumping platform. Trucks used the platform to load garbage and ashes on barges. An electric bucket conveyor used to load ashes into barges at a rate of 35 cubic yards per hour was also present on the dock (USACE 1953).

In 1959, the newly renovated Betts Avenue facility had a capacity of 800 tons per day. Two high speed electric bridge cranes moved refuse from the receiving pit to the charging hoppers. From the hoppers, material was either incinerated in one of the four furnaces or shredded in a swing hammer mill prior to incineration. Ash hoppers located beneath the furnaces had inclined bases that were filled with quench water. A scraper conveyor transferred the residue from the hopper to trucks for transport to the landfill (Samson 1951).

Prior to the 1950s, air pollution control technology was not typically included in incinerator facilities. In the 1950s, technological advances in incinerator operations—such as continuous-feed systems and mechanized stoking on moving grates, as well as water-based air pollution control—resulted in reduced particulate emissions at many incinerators (NYCDOS 1948, 1953, 1956; Walsh 2001). In the early 1970s, following passage of federal

emissions standards, more sophisticated pollution control equipment, such as electrostatic precipitators, were installed (Walsh et al. 2001).

4.1.2.6 Early Regulation of Industrial Operations and Wastes

Industrial facilities in Newtown Creek were the subject of frequent public and political debate during the Progressive Era (mid-1800s to 1920s). Modern environmental regulations and agencies did not exist; however, officials from the Brooklyn and Long Island City Boards of Health conducted inspections at factories, evaluated operations and waste disposal, and reported their findings to the public. Investigations could result in fines, increased regulation, or closure of industrial facilities. Investigation reports provide information regarding operations and waste disposal practices associated with a variety of industrial uses as well as detailed descriptions of practices at specific facilities (Hurley 1994; BPL 1886; Baker and Kent 1887; NYSL 1900).

Located across the East River in Kings and Queens counties, businesses on Newtown Creek experienced less regulation and public scrutiny than their Manhattan counterparts. By the early 1870s, gas-houses, fat-melting, and rendering facilities had been banned from Manhattan. The NYC Board of Health did not have jurisdiction in Queens. Reformers lobbied the state legislature and the New York State Board of Health (NYSBOH) to regulate Newtown Creek industries (Hurley 1994).

Disposal of the sludge acid generated by the Newtown Creek oil refineries was an extremely contentious issue and was frequently the topic of public discourse. In 1885, the LIRR protested to the Long Island City Board of Health that the beach and meadows of Newtown Creek were covered with black deposit of sludge acid discharged from oil works and the stench was bothering the railroad's passengers and employees (BPL 1885).

In 1887, the Brooklyn Department of Health inspected the following oil refineries located on Newtown Creek: James Donald and Co. (Locust Hill Works), Central Refinery, Sone & Fleming Manufacturing Co., Empire Refining Co., and the Brooklyn Refinery. The inspectors observed leaks from tanks, pipes, and other equipment at all the facilities. While some facilities had installed traps to minimize the flow of oil into the creek, many had not

and significant quantities of oil and oily wash water generated during the kerosene treating process were observed flowing into Newtown Creek (Baker and Kent 1887).

In 1890, at the request of the mayor of Long Island City, the New York State Board of Health conducted a series of investigations at factories and other establishments on Newtown Creek that "had the reputation of being nuisances and prejudicial to public health" (NYSL 1900). Eight varnish and printing works, including Meyer and Lowenstein, Lawson, Valentine & Co., Emil Calman & Co., J.H. Bonnell & Co., and W.D. Wilson, were inspected. The primary nuisances created by these factories were odors from boiling linseed oil. In the larger facilities, boiling pots were outfitted with hoods. Exhaust was routed through a cold water condenser prior to discharge to Newtown Creek. Smaller facilities did not control exhaust from the boiling pots (NYSL 1900).

Fertilizer and fat rendering facilities, including Peter McArdle and Preston Fertilizer Co., were also inspected. At several facilities, vent pipes from the iron fat-boiling kettles terminated in tanks of "foul water" located beneath the tanks (BPL 1890). Waste liquor from the grease vats and digesters was often released into Newtown Creek (NYSL 1900).

While in many cases impacts to water and aquatic life were noted, central to the nuisance debates and their resonance with the public was miasma theory, the notion that many diseases were transmitted by foul smelling and poisonous vapors. Politicians, reformers, community activists and prominent citizens protested the nuisances caused by the industrial facilities on Newtown Creek. The public and the regulators (local and state Boards of Health) focused on minimizing nuisance odors, and in response, manufacturers employed processes that transferred contaminants from air to water (essentially scrubbing their emissions) and discharged the water to Newtown Creek. As germ theory became accepted in the late 19th and early 20th centuries, nuisance odors held less traction with the public and political leaders (Hurley 1994).

4.1.2.7 Clean Water Act and Modern Environmental Regulation

The Federal Water Pollution Control Act, 33 U.S.C. §1342 et seq., commonly referred to as the Clean Water Act (CWA), was enacted in 1972. The CWA makes it unlawful to discharge

any pollutant from a point source into navigable waters, unless a permit is obtained. Violations of the CWA can result in both civil and criminal prosecutions by the federal government or state controlling authority. The CWA authorizes USEPA to establish and administer the NPDES program for discharges of pollution into the navigable waters of the United States.

The NYSDEC, through a partnership agreement with USEPA, administers this program in New York State. Since 1973, NYSDEC has conducted the State Pollutant Discharge Elimination System (SPDES) permit program pursuant to Article 17, Titles 7 and 8 of the New York State Environmental Conservation Law.

4.1.3 Stormwater and Wastewater Collection and Conveyance Systems

Municipal and private stormwater and wastewater systems and infrastructure have been in place for many years in New York City boroughs, including Brooklyn and Queens. Historical information is voluminous and this topic has been identified for further review and summary in future RI/FS documents. A brief summary of municipal systems over time is discussed below.

4.1.3.1 Early Sewer Infrastructure and Regulations

Prior to 1857, approximately 5.5 miles of sewer existed within Brooklyn. These sewers were evidently built to relieve certain depressed portions of the city of the accumulations of water which must have found place there during heavy rains (i.e., flooding). In April 1857 the legislature authorized the construction of a system of sewerage for the city of Brooklyn. This was a combined system intended to manage wastewater as well as stormwater runoff and groundwater from low-lying areas. Design considerations for the development of the sewer system included the requirement that wastes be conveyed to a discharge point within one day of origination and a minimum rate of inclination in most locations. For inclinations less than one in four hundred and forty some flushing was necessary for large sewers; however, in small sewers the rates of inclination rendered flushing unnecessary. Sewers were sized for a maximum rainfall of 1 inch per hour (Board of Water Commissioners 1867).

Pipes were typically lazed earthenware pipes of 12, 15 and 18 inch diameters, three feet in length and laid with sleeves. Manholes were placed 100 to 150 feet apart. Rainwater was conveyed to the sewer via gutters in the street. Cast-iron pipe was used to transport the sewerage to the ultimate discharge locations, typically at the end of piers. All the Brooklyn main sewers delivered into tide-water, and where advantage can be taken of piers at the poing of discharge so that the sewerage waters may reach the tidal currents and be carried away by them. The bottom of the outlet of the sewer was placed approximately a foot above low water-mark (Board of Water Commissioners 1867). The system was designed to carry the outlet sewers into the tidal currents, and to avoid delivering into eddies or docks where the sewerage matter would be retained, and would eventually become offensive (Board of Water Commissioners 1867). To determine the limits of sewerage basins, the whole city was carefully leveled and a map prepared, showing the height above tide of every street corner and occasionally of intermediate points. The topographical features of the ground generally indicated the outlines of the basins, but these were sometimes extended or modified to meet other requirements. By January 1865, 97.76 miles of sewer had been built in the City of Brooklyn (Board of Water Commissioners 1867).

During the second half of the nineteenth century, many sewers were constructed prior to the boroughs of Brooklyn and Queens being consolidated into New York City, which occurred in 1898. According to Heaney et al., these combined sewers were "considered state-of-the-art pollution control" (1999). Brooklyn's sewer system had more than 500 miles of sewer lines by 1895 (NYT 1895), and by 1910, there were sewer lines in the towns of Long Island City, Flushing, College Point, and Whitestone (NYT 1910). The sewer construction, there and in many cities throughout the country, was a direct response to the public health threat posed by epidemic diseases, largely attributed to land-based sewage disposal (Solomon 2007).

In 1939, the size, location and type of known sewers discharging into the creek and tributaries were documented by the U.S. Army Corps of Engineers. Twenty-two NYC-owned combined, storm and sanitary outfalls and five industrial waste outfalls (specifically fat reduction for the following properties: Van Iderstine Company, Long Island Soap Company, Inc., Fischer Bros., Joseph Rosenberg's Sons, Gieger Products Company) to Newtown Creek and its tributaries were identified in the report (USACE and USN 1939).

Starting in 1901, individual City boroughs regulated the use of the City's sewer systems, chiefly by prohibiting some discharges, such as garbage and volatile liquids. The first Citywide unified rules and regulations for the use of the sewer system were adopted in 1938 (Imbelli et al. 1968). In 1963, a comprehensive industrial waste control program was promulgated, requiring permits for the discharge of industrial waste and otherwise toxic substances and imposing a sewer surcharge on industrial waste discharges (Imbelli et al. 1968).

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4.1.3.2 Current Stormwater and Wastewater Infrastructure

Approximately 363 individual points have been identified that discharge to the Study Area. These individual points, generally referred to as outfalls, are locations of point source discharges of stormwater, combined sewer overflows, or industrial wastewaters transported via a collection system. According to the SPDES permits from the Bowery Bay WPCP and the Newtown Creek WPCP, 23 of the outfalls are combined sewer overflow (CSO) outfalls and 5 are municipal separate stormwater system (MS4) outfalls that discharge to Newtown Creek or its tributaries. Available NYSDEC and USEPA information indicates that 14 SPDES permitted sites are located within the HDR Area and discharge to the Study Area (see Figure 4-32).

Information used to evaluate outfall locations and types includes NYCDEP maps and tabulated data, a 2003 NYCDEP report titled *New York City Shoreline Survey Program: Newtown Creek Water Pollution Control Plant Drainage Area*, and excerpts from a similar report dated 2008 (NYCDEP 2003b and 2003c). Latitudinal and longitudinal outfall location data found in the 2003 and 2008 NYCDEP reports were rounded to the nearest second. This resulted in outfall location discrepancies of up to approximately 200 feet. Based on the information available, outfall locations were geo-referenced and error could be a few hundred feet. Outfall locations are being verified during field investigations and Anchor QEA is working with the City of New York to reconcile outfall specifications and locations through the RI/FS.

Outfall locations and types are preliminary, compiled, and estimated based on information found in available files and available resources, as described above and are further discussed in Section 6.1.2. Developing a comprehensive understanding of the private and municipal systems is an ongoing effort.

Several types stormwater and wastewater infrastructure exist within the HDR Area. They are characterized as follows in the 2007 Landside Modeling Report:

Combined Sewers. Combined sewers serve areas in which sanitary sewage and stormwater are collected and conveyed to the WPCP in the same pipe, thus requiring flow regulation and relief discharge through a CSO outfall directly to a waterbody when storm flows exceed the hydraulic capacity of the conveyance pipe.

Separate Sanitary Sewers. Separate sewers are those where sanitary and storm flows are collected locally in separate piping systems. During conveyance, the sanitary flow will reach the WPCP with no stormwater interaction. Likewise, separate storm sewer systems convey stormwater through the municipal separate storm sewer system (MS4) to waterbodies without mixing with sanitary sewage. In most of the NYC service area, separately collected sanitary wastewater enters a combined sewer as it is conveyed downstream toward the WPCP and may therefore overflow to a water body through a regulator given sufficient volume during a wet weather event.

Other Areas Tributary. 'Other' areas are neither combined nor sanitary but contribute stormwater to the collection system, impacting the WPCP and CSO discharges. Examples of these areas are parks and cemeteries where stormwater is collected and conveyed to nearby combined service areas, and regulated stormwater discharges that are partially diverted to the combined sewers prior to discharge.

Stormwater Runoff Areas. There are two basic types of stormwater runoff. The first type is direct drainage, which refers to those areas where stormwater flows directly to the local water bodies through overland sheet flow. The second type is those areas where stormwater is collected and routed through a storm sewer system. Stormwater runoff areas do not contribute sanitary flow to the WPCP and are not physically connected to the collection system, although stormwater outfalls are permitted as MS4s in the WPCP SPDES permits.

The locations of interceptor pipelines (large pipes designed to intercept and redirect combined flows from discharging directly into surface water bodies) within the HDR Area are shown on Figures 4-30 and 4-31 (for the Newtown Creek WPCP service area and Bowery Bay WPCP service area, respectively). Three interceptor pipelines are located within the Brooklyn/Queens portion of the Newtown Creek WPCP service area: West Street, Morgan Avenue, and Kent Avenue. The West Street and Kent Avenue interceptors collect wastewater and combined sewage from the northwestern and southwestern part of the Brooklyn drainage area, respectively. The Morgan Avenue Interceptor serves the east side of the drainage area, including the portion from Queens. The Kent Avenue and Morgan Avenue interceptors join before entering the Brooklyn Pump Station located in the WPCP property (NYCDEP 2007c).

One of the interceptor pipelines within the Bowery Bay WPCP service area, the Low Level Interceptor, serves a portion of the Newtown Creek HDR Area. The Low Level Interceptor runs northward along the Lower East River and carries flow from 4,374 acres in the western portion of the Bowery Bay WPCP service area.

Regulators are located along interceptor pipelines which divert CSOs to receiving waters when storm flows exceed the hydraulic capacity of the conveyance pipe. (NYCDEP 2007a). Each regulator typically has two control structures. The primary structure is connected to

the downstream interceptor and conveys all dry weather flow and wet weather flow through a branch interceptor to the main interceptor. If the storm flows exceed the hydraulic capacity of the conveyance pipe, the second control structure generally diverts excess wet weather flow to a CSO outfall (NYCDEP 2007a).

Two of the three interceptor pipelines within the Newtown Creek WPCP service area have regulators that discharge to Newtown Creek. Five regulators along the Morgan Avenue interceptor and the two regulators along the West Street interceptor discharge to Newtown Creek at their respective CSO outfalls (NYCDEP 2007c) (see Figure 4-30). The Low Level interceptor in the Bowery Bay WPCP service area has 13 regulators that discharge to Newtown Creek (NYCDEP 2007b) (see Figure 4-31).

4.1.3.2.1 Municipal Water Pollution Control Plants

The Newtown Creek HDR Area includes portions of the Newtown Creek and Bowery Bay sewersheds, which are served by separate WPCPs (the Newtown Creek WPCP and Bowery Bay WPCP, respectively).

The Newtown Creek WPCP collection system serves over one million residents within a 15,656 acre drainage area (http://www.nyc.gov/html/dep/html/wastewater/wwsystem-plants.shtml). The plant, located at Greenpoint Avenue in the Greenpoint section of Brooklyn, went into operation in 1967 with an initial flow from Brooklyn and Queens. The Manhattan flow was added in 1968 with the completion of the Manhattan Pumping Station, located at Avenue D between East 12th Street and East 13th Street, which pumps wastewater from Manhattan through a deep tunnel beneath the East River into the main plant influent conduit, where it joins the Brooklyn/Queens pump station flow (NYCDEP 2007c). The plant was designed as a high rate activated sludge plant, a secondary biological process that attains secondary levels of treatment with a short hydraulic retention time (typically less than 4 hours), with a dry weather design capacity of an average of 310 million gallons a day ("mgd"). Plant effluent is discharged into the East River via a 12-foot diameter outfall, as permitted by NYSDEC under SPDES permit number NY-0026204 (NYCDEP 2011).

Section 301 of the CWA established a required performance level, referred to as "secondary treatment," that all POTWs were required to meet by July 1, 1977. The secondary treatment process includes physical, chemical, and biological processes that remove at least 85% of 5-day Carbonaceous Biochemical Oxygen Demand (CBOD5) and Total Suspended Solids (TSS). As part of a Consent Judgment with DEC and the State of New York, the WPCP is currently at the end of a $5 billion extensive upgrade to achieve secondary treatment and further improve water quality, as well as to increase the plant's wet weather treatment capacity from a minimum of 620 mgd to a minimum of 700 mgd. NYCDEP began the upgrade in 2000 and the Plant achieved secondary treatment in June 2011.

The upgraded Newtown Creek WPCP includes improved operating systems, expanded electrical power capacity, new transformers, new disinfection systems, new digesters and centrifuges, new pumping stations, and new aeration, sedimentation and sludge storage tanks. The WPCP's disinfection systems have been completely reconstructed to more efficiently eliminate pathogens in the treated effluent. The upgraded pump stations are complete and the new pumping systems will be completed summer 2012. The final major part of the upgrade includes construction of the central residuals building, new aeration tanks, and other odor minimization work.

While not on or near Newtown Creek, the Bowery Bay WPCP located in Astoria, Queens, collection area encompasses part of the Newtown Creek drainage basin. The plant is located at Berrian Boulevard in the Astoria section of Queens and serves an area of 15,203 acres (http://www.nyc.gov/html/dep/html/wastewater/wwsystem-plants.shtml) in northwest Queens. The Bowery Bay WPCP was originally designed in 1938 to provide primary treatment to a flow of 40 mgd from a population of 308,000. In 1973, the plant was upgraded and expanded. The expanded plant was designed for the expected 2020 population of 920,000 contributing an average flow of 150 mgd. In accordance with its SPDES permit, the expanded plant is capable of providing primary treatment for a minimum wet weather flow of 300 mgd (2 times the dry weather flow) and secondary treatment for a minimum wet weather flow of 225 mgd (1.5 times the average flow). The plant is currently undergoing an upgrade to improve biological nutrient reduction.

The Bowery Bay WPCP receives wastewater from 16 pump stations (NYCDEP 2007b). The plant discharges treated effluent through the Rikers Island Channel to the Upper East River, as permitted by SPDES permit number NY-0026158 (NYCDEP 2011).

4.1.4 Industrial Pretreatment Program

Since 1987, NYCDEP has implemented an Industrial Pretreatment Program (IPP) pursuant to 40 C.F.R. Part 403. USEPA requires approximately 1,500 municipalities across the country to implement these programs, which aim to control the introduction of toxic substances into public sewers that are tributary to publicly owned treatment works (POTWs) by regulating the discharge from Significant Industrial Users (SIUs). USEPA and/or New York State DEC annually audit the City's IPP to ensure that it is acceptable.

DEP's IPP work consists of P-cases, described in detail below, as well as other program components such as Persistent Pollutant Trackdown; Perchloroethylene Regulatory Compliance; Grease Reduction Enforcement and Education; and Complaint Response. In the City, regulated facilities often house metal etching, electroplating, inorganic chemical, drum recycling, or paint and ink manufacturing industries. Should these facilities fail to comply with the IPP, DEP is authorized to issue Notices of Violation (NOVs), and, for more serious offenses, compel violators to develop and follow compliance schedules. In a typical year, DEP conducts over 1,000 facility inspections and hundreds of sampling programs, and issues over 1,000 NOVs.

Within the P-Case program, facilities that are subject to USEPA's nationwide categorical pretreatment discharge standards are classified as a SIU. Other criteria for classifying P-Cases as SIUs are the facility's flow of process wastewater (a daily discharge average of over 25,000 gallons, or a process wastestream which makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant, also qualifies a facility as a SIU), and/or the pollutant concentration of its discharges (a facility with a reasonable potential to adversely affect a POTW's operation or exceed a pretreatment standard also qualifies as a SIU) (40 C.F.R. § 403.3(v)). Non-SIUs are discretionally regulated by NYCDEP under the jurisdiction of the General Pretreatment Regulations, 40 C.F.R. Part 403, and the New York City Sewer Use Regulations, 15 RCNY Chapter 19. These facilities

include paint and ink formulators, photoengravers, industrial launderers, steel drum reconditioners, and auto radiator repair shops. Non-SIU facilities also include facilities subject to one of the categorical discharge standards but not discharging any wastewater from a categorical process of concern (or zero categorical discharge). Facilities that store a significant amount of chemicals on-site with no wastewater discharges can also be regulated as Non-SIUs, because these chemicals could inadvertently or deliberately be discharged into the public sewers. Furthermore, in addition to the nationwide categorical discharge standards, NYCDEP also imposes local limits on cadmium, hexavalent chromium, copper, lead, nickel, zinc, silver, cyanide, mercury, non-polar material and pH, which are monitored and enforced through the IPP program.

At the end of 2011, NYCDEP had a total of 338 P-Cases, of which 191 were SIUs and 147 were Non-SIUs (NYCDEP, IPP Annual Progress Report 2011). There are currently 14 SIUs and 18 Non-SIUs directly adjacent to Newtown Creek. In the Newtown Creek catchment area, the metal loadings from SIUs were 1.58 lbs/day in 2011 (see NYCDEP, 2011 IPP Annual Progress Report). This industrial flow is treated at the Newtown Creek Water Pollution Control Plant. On the minority of days when a sufficiently severe rainfall causes a combined sewer overflow, there is a potential for at least some of these loadings to discharge to Newtown Creek.

4.1.5 Hydrology, Hydrogeology, and Beneficial Uses

As discussed in the previous sections, Newtown Creek has been greatly altered over the last 200 years. The width and depth of the navigation channel were increased by dredging, the banks were secured with bulkheads, and the watershed has been developed with impervious surfaces and heavy industrial uses. The following sections describe the current hydrologic and hydrogeologic conditions of the creek.

4.1.5.1 Newtown Creek – Current Conditions

The 7,440-acre drainage area for Newtown Creek is fully urbanized with no remaining natural marshlands or freshwater streams; therefore, the creek has no water source such as a continuous stream of water (AECOM 2011; NCBOA 2012). Flows to the creek and its tributaries consist of wastewater discharges from combined sewer overflows (CSOs),

permitted and unpermitted discharges, stormwater runoff, groundwater discharges and tidal exchange with the East River. The creek rises and falls with the tide from the East River (USEPA 2010). Newtown Creek receives approximately 2 billion gallons of CSO, or a combination of untreated sewage and rainfall each year, which makes up more than 90 percent of the wet weather flow (AECOM 2011). Approximately 17 percent of the watershed surface area drains directly to the Newtown Creek while 83 percent drains into a sewer system that collects stormwater, sanitary sewage, and industrial discharges. In addition to direct overflows from adjacent sites and private stormwater and industrial outfalls, CSO outfalls discharge to Newtown Creek and its tributaries (AECOM 2011). During a typical precipitation year, CSO events occur an average of 70 times per year (AECOM 2011) when the volume of water being conveyed by the combined sewer exceeds the system's capacity. A CSO event occurs in a combined municipal sewer system when flows exceed the wastewater treatment plant system and supporting infrastructure's capacity and untreated CSOs are discharged directly to a receiving waterbody as described in Section 5.2.1.6.

The USGS groundwater model of western Long Island estimated that pre-development, groundwater discharged at 2.5 cubic feet per second to the creek (Misut and Monti, 1999). This discharge was depleted by large-scale pumping in the first half of the 1900s to no discharge to the creek (see 4.1.4.6.2 below) causing a reversal where the creek, the East River and surrounding saltwater bodies were drawn into the aquifer for many decades (Misut and Monti, 1999). The Jamaica Water Supply Company and large-scale pumping responsible for the over-taxing the groundwater was significantly reduced by 1990s. The USGS model estimated groundwater discharge in 1991 to be 70 million gallons per year to the creek. Since that time groundwater levels have been significantly recovering, which corresponds to increased groundwater discharge to Newtown Creek (Cartwrite, 2001. (. A complete water budget for the creek will be developed through the RI.

4.1.5.2 Wetlands

Wetland, salt marshes, intertidal mudflats, and other features associated with pre-development conditions in the Study Area have largely been dredged and filled (see Sections 4.1.1.2 and 4.1.1.4 for further discussion on dredging and filling). In 1973, in response to the

diminishing wetland habitat, New York State passed the 1973 Tidal Wetland Act, and in 1974, established the New York State Official Tidal Wetlands Inventory, a set of maps delineating and classifying all the tidal wetlands in New York (NYSDEC 2012d). At this time, Newtown Creek was designated a subtidal littoral zone (LZ), or a portion of a tidal water shallow enough (typically less than 6 feet deep) to allow sunlight to penetrate to the bed floor, thereby creating an environment suitable for a variety of rooted and floating aquatic plants and animals (NYSDEC 1974, 2012b; NYCDEP 2003d). Newtown Creek is also designated as an estuarine subtidal open water wetland by the U.S. Fish and Wildlife Service (USFWS); and is depicted on Brooklyn, New York, USFWS National Wetlands Inventory mapping (USFWS 2012).

4.1.5.3 Water Body Use Classifications

In accordance with the provisions of the Clean Water Act, the State of New York has developed a system of water body classifications based on designated uses (NYCDEP 2011). These classifications are used to implement water quality standards for waters within the State of New York's jurisdiction (NYCDEP 2011). Newtown Creek is classified by the State of New York as a Class SD saline surface water with best uses designated for fishing and fish survival (see Figure 4-11). Class SD waters have natural or human-made conditions limiting attainment of higher standards (NYCDEP 2011). The nearby East River is classified as a Class I saline surface water, where best usages are secondary contact recreation and fishing (NYCDEP 2011). Class I waters are also suitable for fish propagation and survival.

Newtown Creek is also located within the Interstate Environmental District, as established by the Tri-state Compact[2] (Title 5 - § 21-0501), as described in Section 4.1.2.2 (ONECLE 2012). Newtown Creek is listed as a Class B-2 waterbody by the IEC (i.e., primary usage is passage of anadromous fish, and maintenance of fish life). This classification implements a dissolved oxygen standard consistent with the existing New York State Class SD classification (NYCDEP 2011).

[2] As first entered into pursuant to Chapter 4 of the Laws of 1936, as reenacted by Chapter 476 of the Laws of 1961, and as amended by Chapter 1046 of the Laws of 1969, and hereby continued (ONECLE 2012).

Newtown Creek is also located within the New York State Coastal Zone, and designated one of six New York City SMIAs, also described in Section 4.1.2.2.

4.1.5.4 Impaired Water Bodies

Newtown Creek was first listed on the Section 303(d) List in 1998. It is included on the New York State 2010 Section 303(d) List of Impaired Waters[3] due to low dissolved oxygen. The creek is included on Part 3c and 4b of the list. Total Maximum Daily Load (TMDL) development may be deferred pending the implementation and evaluation of other restoration measures. Newtown Creek is also assessed as impaired by floatables and odors. A New York State health advisory restricting fish consumption in the East River and its tributaries, including Newtown Creek and its tidal tributaries, has been in effect since 1998 to 1999 (NYSDEC 2011b; NYSDEC 2012c).

4.1.5.5 Regional Hydrogeology

The regional hydrogeologic setting in northern Kings County and southern Queens, Long Island, New York, consists of impermeable Precambrian and Paleozoic crystalline bedrock overlain by the Upper Cretaceous Raritan formation, Magothy formation and Matawan Group (undifferentiated), unconsolidated Pleistocene deposits and upper Pleistocene glacial deposits and Holocene shore, beach salt-marsh deposits and alluvium along with local occurrences of artificial fill (Buxton et al. 1981; Soren and Simmons 1987). Figure 4-12 shows a stratigraphic column for the major units listed above along with general descriptions. Beginning in the Cretaceous period, the bedrock throughout Long Island was eroded prior to deposition of the unconsolidated sediments above. The bedrock outcrops in northwestern Queens County (Buxton et al. 1981; Soren and Simmons 1987) and dips towards the southeast. The overlying unconsolidated deposits, from the Cretaceous period through the Upper Pleistocene and Holocene, also dip to the south. The Cretaceous sediments found immediately above the crystalline bedrock are continental in origin, deltaic deposits that were repeatedly eroded during later Pleistocene glacial events (Buxton et al. 1981).

[3] "Impaired Waters" are water bodies where frequent/persistent water quality, or quantity, conditions and/or associated habitat degradation discourage the use of the water body; and/or support of the water body use requires additional/advanced measures or treatment (NYSDEC 2011).

In Queens County, this resulted in a large erosional valley forming on the surface of the Cretaceous deposits running north-south through the center of the county to the east of the HDR Area towards Jamaica Bay (USGS 1987). After this last major erosional episode, there was deposition, during an interglacial period, of clay units in lagoon and shallow marine environments prior to the Wisconsinan glaciation that deposited the uppermost unconsolidated sediments on Long Island (Buxton et al. 1981). The hydrogeologic units found within Kings and Queens counties are discussed briefly in the following sections in descending stratigraphic order.

The major topographic feature in Kings and Queens counties is a single east-west trending Upper Pleistocene terminal moraine deposit (Harbor Hill Terminal Moraine) with a maximum approximate altitude of 260 feet (Soren and Simmons 1987). This terminal moraine is located in the southern portion of the HDR Area (see Figure 4-13). South of the terminal moraine are deposits of sand and gravel laid down as water moved beneath the melting glacier and exited (Soren 1971). North of the terminal moraine is a large area of variable texture till including the HDR Area. The thickness of the Upper Pleistocene deposits range from negligible in northwestern Queens County, where bedrock outcrops, to 300 feet thick in the terminal moraine and buried valleys (Buxton et al. 1981; Suter et al. 1949) and comprise poorly sorted clay, sand, and gravel till with locally extensive clay and silt lenses. These deposits form the Upper Glacial Aquifer, and water within this aquifer is generally unconfined but can be locally confined between clay or silt beds. Perched groundwater bodies can also be found above the water table within the Upper Glacial Aquifer (Buxton et al. 1981).

The Gardiners clay occurs in most of Kings County and the southwestern portion of Queens County and can be found at elevations ranging from 50 feet below mean sea level (MSL) to 200 feet below MSL in southern locations (see Figure 4-14; Buxton et al. 1981). The clay layer was deposited in shallow bays and estuaries during an interglacial interval (Buxton et al. 1981). The Gardiners Clay consists chiefly of gray and green-gray clay and silt with local lenses of sand, gravel, and sandy clay (Perlmutter and Geraghty 1963; Krulikas 1989), and deposits range in thickness from negligible along the northern limit to approximately150 feet in areas of previous high erosion (Buxton et al. 1981). The Gardiners Clay is absent from two areas in southern Queens County where deposits of the Magothy formation and Matawan

group or Jameco Gravel are found at higher than average elevations (Buxton et al. 1981). Where found, the Gardiners clay confines waters in the Jameco Gravel and Magothy aquifers (Soren and Simmons 1987).

The Jameco Gravel Aquifer is found in most of Kings County and southern Queens County (see Figure 4-15). The surface of the Jameco Gravel is generally found approximately 90 feet below MSL at its highest elevations and more than 200 feet below MSL in the south (Buxton et al. 1981). The thickness ranges from negligible near its northern edges to more than 200 feet in central Queens County (Buxton et al. 1981; Soren and Simmons 1987). This deposit is believed to have been deposited as outwash by glacial melt-water streams on the eroded surface of the Magothy formation, filling a buried valley believed to be an ancestral diversion of the Hudson River (Soren 1978; Buxton et al. 1981). The Jameco Gravel is composed of dark-brown and dark-gray, predominantly coarse sand and gravel (Buxton et al. 1981; Soren and Simmons 1987). The Gardiners Clay confines the Jameco Gravel Aquifer where it occurs in southern Queens County, except in areas near Woodhaven and Ozone Park where the Gardiners Clay is missing and the Jameco Gravel is overlain by younger outwash deposits. The Jameco Gravel Aquifer exhibits water-table conditions at these locations (Soren 1971).

The surface of the Magothy Aquifer in Kings and Queens counties ranges in altitude from a few feet above MSL in the northeast to more than 400 feet above MSL in the buried valley to the south, and it can be up to 500 feet thick (see Figure 4-16; Buxton et al. 1981). The Magothy Aquifer is the largest hydrogeologic unit and the principal aquifer on Long Island and is made up of the undifferentiated Matawan Group and Magothy formation (Soren 1971; Buxton et al. 1981; Soren and Simmons 1987). The deposits composing the aquifer are characterized as fine to coarse sand and silty sand, with lesser occurrences of interbedded clay and silt (Soren 1971; Buxton et al. 1981). The Magothy Aquifer ranges from poorly confined to highly confined, depending on the depth within the aquifer being tested (generally the deeper the more confined) and the presence or absence of the Gardiners Clay; Soren 1971). In Queens County, the Magothy Aquifer is missing in the western and northern parts due to the high degree of erosion that occurred prior to the Pleistocene depositional events (Soren 1971; Soren and Simmons 1987).

The Raritan formation is composed mainly of the Lloyd Sand Member and a Clay Member, which together comprise the oldest Cretaceous deposits found in Queens County and Long Island. The Clay Member can be found as shallow as a few feet above MSL in the north and as deep as 650 feet below MSL in the south (Buxton et al. 1981). The Clay Member lies conformably above the Lloyd Sand Member, which lies unconformably on bedrock, and is disconformably overlain by the Magothy formation, Jameco Gravel, Gardiners Clay, and Upper Pleistocene deposits, respectively, due to the complex erosional history after deposition (Buxton et al. 1981; Soren and Simmons 1987). The Clay Member confines the Lloyd Aquifer below, which is a highly confined aquifer due to the clay layer above and the bedrock below (Soren and Simmons 1987). The Lloyd Aquifer, shown in Figure 4-17, can be up to 300 feet thick in Queens County but occurs to the east of the HDR Area (Buxton et al. 1981) and due to its highly confined nature is very susceptible to salt-water intrusion from over-pumping (Soren and Simmons 1987).

In addition to the hydrogeologic units described above, where low-lying areas were filled, there can be local areas of groundwater present above the Upper Glacial Aquifer. These areas are not extensive but have been encountered within the Study Area (see Section 4.1.1.4). Groundwater deposits such as these will likely be perched above the regional water table.

Groundwater flow in both the Upper Glacial or surface and Magothy Aquifers is generally to the north and south, away from the central, east-west trending morainal ridge in Kings and Queens Counties. Within the HDR Area groundwater flows generally towards Newtown Creek but begins to have a westerly component for some uplands areas within the HDR area with closer proximity to the East River (Misut and Monti, 1999). Groundwater flow is generally impacted by surficial features, such as watershed boundaries, groundwater withdrawal and recharge basins. Within the HDR Area the presence of buried utilities and tunnel dewatering will also exert some control over local flow as well.

4.1.5.6 Hydrogeology of Newtown Creek Watershed

Based on hydrogeologic investigations undertaken in the Newtown Creek watershed in the area of Greenpoint immediately adjacent to the creek, the subsurface is comprised of

Pleistocene glacially-derived sediments (tills and lacustrine deposits), Quaternary estuarine and alluvial sediments and recent fill (NYCDEP 2001). the investigation undertaken for the upgrade of NCWPCP included over 300 borings to the crystalline bedrock in the Greenpoint area of Brooklyn within the Newtown Creek watershed and these borings identified seven areally extensive strata: miscellaneous fill (F), organic silty clay (O1), organic silty sand (O2), soft to stiff organic silt and clay (O3), lake sand (L), varved silt and clay (V) and till (T). The till overlies weathered bedrock (NYCDEP, 2001).

Based on the hydraulic properties of the strata, three aquifers and two confining units were identified in the unconsolidated soils at the Newtown Creek WPCP. These aquifers were classified as shallow (water table), intermediate, and deep. The shallow water table aquifer is the uppermost water-bearing unit and is found in the miscellaneous fill (F). The water table aquifer is separated from the intermediate aquifer by organic silty clay (Layer 01) which acts as a confining unit. The intermediate confined aquifer is in the organic silty sand (Layer 02), soft to stiff organic silty clay (Layer 03), and lake sand (Layer S 1), which are all hydraulically connected. The intermediate aquifer is separated from the deep aquifer by the varved silt and clay (Layer V) which acts as a confining unit. The deep confined aquifer is in the till (Layer T).

The unconfined water table aquifer occurs within the miscellaneous fill (F). Miscellaneous fill is composed of dark gray to black sand and gravel with lesser amounts of silt and clay. Coal, cinders, rubble, brick, glass and ceramics occur in varying amounts. The water table aquifer (F) ranges from approximately 3 feet above msl to 10 feet below msl with an average thickness of approximately 8 feet and a maximum of 18 feet.

Organic silty clay underlies the miscellaneous fill throughout the NCWPCP. This confining unit is formed by salt marsh deposits composed of soft to medium gray black and brown organic clay with occasional shells, vegetation, peat, meadow mat, gravel and fine sand. This layer is 12 to 15 feet thick, with the top varying from 5 to 20 feet below mean sea level. Three layers of similar hydraulic properties have been combined to form the Intermediate Aquifer. The three units include the organic silty sand (Layer 02), soft to stiff silty clay (Layer 03), and lake sand (Layer S1). Organic silty sand (Layer 02) underlies the organic silty clay and consists of compact, gray, black, and brown, organic silty fine to medium sand

grading to silty clay, with shells, wood, coarse sand and gravel, and plant material. These deposits were not found at all locations. The organic silty sand ranges in thickness from zero to seven feet. Soft to stiff organic silt and clay (Layer 03) consists of soft to stiff, gray to grayish brown, organic silty clay with fine to medium sand, shells, and gravel. The soft to stiff organic silt and clay, was of limited extent and was not encountered at the all locations. This deposit has a maximum thickness of 12 feet and an average thickness of four feet.

The Lake Sand unit (Layer S1) contains dark gray to brown and olive brown fine to coarse-grained sand with silt, clay, gravel, and traces of plant material and shells. Some layering was visible in samples and the lower portions of the lake sand are coarser and include medium to coarse grained sand fine to medium gravel and cobbles. The lake sand ranges in thickness from five to 15 feet, but may be up to 20 feet thick at some locations. The lake sand extends from about 20 to 40 feet below mean sea level and was areally extensive but not encountered at all locations.

The Intermediate Aquifer (02/S1) ranges from approximately 12 to30 feet with an average thickness of approximately 13 feet and a maximum of 39 feet. This aquifer is semi-confined because it is over and underlain by the semi-confining organic silty clay (Layer 01) through which some leakage occurs. At some locations there is no confining unit separating the Intermediate and Deep Aquifers.

Varved silt and clays underlie the soft to stiff organic silt and clay and lake sand. The varved silt and clay is dense, stiff, compact, thinly layered silt and clay. The silt layers are brown and tan to olive brown while the clay layers are gray. Occasional thin, reddish-brown sand stringers with very fine gravel were interlayered with the silt and clay. The varved silt and clay is a confining unit, and ranges from 30 to 70 feet below mean sea level, with a thickness of four to 35 feet. The varved silt and clay is areally extensive but not present at all locations. Where it is not present the Intermediate and Deep Aquifers are in direct contact.
The Deep Aquifer is composed of till (T) and is bounded at the bottom by weathered bedrock. The till (T) was divided into three components: glacial outwash and two glacial tills. The outwash component was encountered above the two till components and consists of brown and fine to coarse sand with gravel and boulders. The two till components are sandy and clayey tills, which have been interpreted as ablation till and basal till. Sandy

ablation till is compact, gray and brown, fine to coarse sand with clay, gravel, cobbles and boulders. The clayey basal till is dense, compact, gray and brown, silty clay with fine to medium sand, gravel, and occasional lignite and wood fragments. The Deep Aquifer till (T) is a discontinuous layer and ranges from approximately 40 to 80 feet below msl with an average thickness of approximately 13 feet and a maximum thickness of approximately 60 feet. Decomposed bedrock underlies the till, and ranges in thickness form 0.5 feet to 66 feet. The average thickness is approximately 22 feet.

4.1.5.7 Beneficial Groundwater Uses

As described in the previous sections, the eastern end of Long Island and Kings and Queens counties is an area that experienced an intense period of industrialization followed by a period of relative "quiet" as industry moved elsewhere or was reconfigured to a mix of industry/residential. Throughout these changes, the use of the groundwater present beneath Kings and Queens counties and all of Long Island changed and this section summarizes that usage change. Groundwater has been identified for further review and summary in future RI/FS documents.

4.1.5.7.1 Effects of Urbanization on the Hydrologic System

Throughout Long Island, there are four primary aquifers, as described in Section 4.1.4, which comprise the groundwater system and are used for public and private water supply. These aquifers are considered sole-source water supplies as there are no significant freshwater streams or other surface water bodies on Long Island that could be used as an alternative water supply to groundwater. Groundwater is recharged by some portion of precipitation infiltrating into the subsurface. Under predevelopment conditions, approximately 50 percent of the annual rainfall on Long Island infiltrated to the water table and recharged the groundwater-system. The remainder was lost through evapotranspiration and overland runoff (Misut and Monti 1999).

The first map of the water-table configuration was made in 1903 and serves as an approximation of the predevelopment water table. It is only an estimate as, by that time, urbanization and development was already extensive throughout Kings and Queens counties and large scale pumping from the aquifers was the main water supply (see Section 4.1.4.6.1;

Misut and Monti 1999). Earlier in the area's history, residents and workers would have obtained water from shallow wells, and to a small extent from streams and springs. Water that was not consumed would have been returned to the aquifer through septic systems installed to manage wastewater. This early use would have only caused minor changes to the water-table configuration, but as the demand for public and private industrial water supply increased, larger changes to the water table would have occurred (Misut and Monti 1999).

By the middle of the 19th century, storm and sanitary sewers began to be installed within Kings and Queens counties. These installations helped to prevent contaminants from reaching the groundwater-system and reduced problems with flooding but also diverted a large quantity of water that would have recharged the aquifer system. This process, combined with an increased amount of paved land surface pacing the growth of industry, which reduced the area available for infiltration from precipitation, decreased recharge to the groundwater-system (Misut and Monti 1999). By the 1930s, this ever-increasing demand coupled with reduced area for infiltration and recharge caused severe declines in the water table, which led many lakes and streams to simply disappear and caused intrusion of saltwater into the aquifers in nearshore areas (Buxton et al. 1981; Misut and Monti 1999). By the 1940s, large-scale pumping and reduced recharge caused a large cone of depression where groundwater levels were well below sea level. This condition was documented by the USGS to exist in Kings County (Vaupel et al. 1977). Newtown Creek existed as a north hydraulic boundary to this cone of depression in 1943 with the greatest amount of drawdown occurring in the Newtown Creek watershed just south of Newtown Creek. Figure 4-18 shows the groundwater tables elevation MSL as measured in 1943 (Vaupel et al. 1977).

4.1.5.7.2 History of Groundwater Development

Groundwater withdrawal for public supply had reached approximately 14 million gallons per day (MGD) in Kings County and 28 MGD in Queens County by 1904, with the majority of this water being used in Kings County (Buxton et al. 1981; Misut and Monti 1999). Figure 4-23 shows the estimated public and industrial withdrawals from 1904 to 1972 (Buxton et al. 1981). Industrial withdrawals were originally much higher in Kings County early on but increased in both counties thereafter. The large decrease in withdrawal before 1920, shown

in Figure 4-23, coincided with the opening of the first New York City water tunnel, bringing water from upstate New York and replacing a significant amount of groundwater supply withdrawal (Buxton et al. 1981; Misut and Monti 1999). As a result, the NYC's Department of Water Supply, Gas, and Electricity all but ceased groundwater pumping in Kings County.

The post-World War I era (1918-1930) was a period of consistent increase in groundwater use for both public and industrial supply. After the reduction of withdrawal in 1917, a steady increase followed, resulting in an increase to 29.2 MGD in Kings County. By 1931, 62.0 MGD were being withdrawn for public supply alone. Industrial withdrawals increased as well, to 50 MGD in Kings County and 20 MGD in Queens County by 1930 (Buxton et al. 1981; Misut and Monti 1999).

The 1930s saw a reduction in demand for industrial withdrawals. This reduction is attributed to passage of the Water Conservation Law of 1933, which required that water that was pumped at more than 70 gallons per minute be re-injected to the source aquifer (Buxton et al. 1981; Misut and Monti 1999). This practice resulted in a total of 105 reinjection wells operating by 1937, injecting a total of 33,385 gallons per minute. Additionally, the reduction in demand was also the result of widespread use of the electric refrigerator, which reduced the quantity of water withdrawals for ice making (Buxton et al. 1981). During this time, withdrawals for public supply remained relatively constant in Kings County, at around 30 MGD, but ranged between 40 and 60 MGD in Queens County (Misut and Monti 1999). These withdrawal levels occurred in spite of the completion of Tunnel 2 of the New York City water tunnel system (Misut and Monti 1999).

During World War II, industrial withdrawals increased slightly in Kings County and an increase in Queens County is assumed as well, but no data were available (Buxton et al. 1981; Misut and Monti 1999). As discussed earlier, in Section 4.1.4.6.1, the large-scale pumping and reduced recharge resulted in a large cone of depression forming in the Newtown Creek watershed as shown on Figure 4-18. During this time, Newtown Creek contributed significant amounts of water to the aquifer, leading to saltwater intrusion into the shallow upper glacial aquifer. Cartwrite, 2001. As the CSM is refined the effects of this will be evaluated.

In 1947, public supply groundwater withdrawals ceased in Kings County, primarily due to saltwater intrusion and the pumping center was focused more to the east in Queens County. Withdrawals for public supply continued in Queens County, where such withdrawals increased from 45 MGD in 1950 to more than 60 MGD in the 1970s (Buxton et al. 1981; Misut and Monti 1999; see Figure 4-23). The trend for managing the groundwater system in Queens County during this time was to abandon wells that showed signs of contamination, presumably from saltwater intrusion, and install new pumping wells further to the east, farther from the shore areas and in the center of the island near the higher water levels (Buxton et al. 1981; Misut and Monti 1999). Industrial supply withdrawals between 1947 and the 1970s held steady in Kings County and slightly decreased in Queens County (Buxton et al. 1981). The cone of depression diminished in size but continued to exist adjacent to Newtown Creek until the 1970s when water levels near Newtown Creek had returned to sea level. Figures 4-19 to 4-21 show the water table elevations in 1959, 1966, and 1972. Water from Newtown Creek was still contributing to the groundwater until groundwater levels adjacent to Newtown Creek returned to above sea level (Cartwrite, 2001).

Public supply groundwater withdrawals in Queens County decreased in 1974 with the cessation of pumping in the Woodhaven franchise area due to saltwater intrusion, leaving only the Jamaica franchise area in Queens County (Misut and Monti 1999). Industrial supply withdrawals fell below 10 MGD in Kings County and 3 MGD in Queens County by 1983 (Misut and Monti 1999). With the reduction in pumping, the water table continued to recover with water levels returning to above sea level. By 1991, the USGS estimated that groundwater had returned to discharging to Newtown Creek (Misut and Monti 1999). Water levels have continued to recover since 1991, and groundwater discharge to Newtown Creek has continued to increase. Figure 4-22 shows the 2006 groundwater table as estimated by the USGS (USGS 2006).

4.1.5.7.3 Drinking Water Supplies

The Jamaica Water Supply Company owned and operated a group of wells between 1887 and 1996 that served southeastern Queens County and parts of Nassau County. In 1996, NYC purchased 69 wells located in Queens County, renaming them collectively as "the Groundwater System" (NYCDEP 2012a). The Groundwater System provides drinking water

to fewer than 100,000 people in southeastern Queens. Residents within the system receive groundwater or a mix of ground and surface waters depending on demand and water availability. In 2005, 98 percent of NYC's water came from the Catskill/Delaware System, 2 percent from the Croton System, and less than 1 percent from the Groundwater System (NYCDEP 2005). In 2010, none of the wells in NYC's Groundwater System (Public Water System Identification Number [PWSID] NY7003493) were operational (NYCDEP 2012a).

The NYC watershed is made up of 1,900 square miles in the Catskill Mountains and the Hudson River Valley, divided by the Hudson River with the Catskill/Delaware watershed to the west and the Croton watershed to the east. Together, the systems contain 19 reservoirs and three controlled lakes with a total storage capacity of 580 billion gallons. Each day, approximately 1.4 billion gallons of water are delivered to nearly 9 million people in NYC and in Westchester, Orange, Putnam, and Ulster counties (USEPA 2012a).

The Croton System covers approximately 375 square miles east of the Hudson River, providing about 10 percent of NYC's daily water supply (NYCDEP 2012b). The system was first consolidated from the various water systems used by the early Manhattan settlers from 1776 to 1890, when the New Croton Aqueduct was constructed.

Development of the Catskill region began in 1905 when the Board of Water Supply was created to meet rapidly increasing demand. The Catskill/Delaware System was completed in 1927 and subsequently turned over to NYC's Department of Water Supply, Gas and Electricity for operation and maintenance. In 1927, the Board of Water Supply submitted a plan for the development of the upper portion of the Rondout watershed and tributaries of the Delaware River within New York State. The project was approved in 1928, but subsequently delayed by an action brought by the State of New Jersey to forbid NYC and the State of New York from using the waters of any Delaware River tributary. After the project earned approval from the U.S. Supreme Court, construction of the Delaware System began in 1937 and was completed in 1964. On average, the Catskill/Delaware System supplies approximately 90 percent of NYC's total water supply (NYCDEP 2012b).

4.2 Environmental Data

Environmental data were compiled and evaluated to help identify potential sources to the Study Area. Environmental data were primarily gathered from regulatory databases, including NYSDEC, NYSDEP, and USEPA.

4.2.1 Data Collected from State and Federal Environmental Programs/Databases

State and federal environmental programs applicable to Newtown Creek include the following:

State and Federal Environmental Programs

Program	Abbreviation	Agency
Comprehensive Environmental Response, Compensation, and Liability Act (Superfund)	CERCLA	U.S. Environmental Protection Agency
Resource Recovery and Restoration Act	RCRA	
Toxic Release Inventory System	TRI	
Air Facility System	AFS	
National Pollutant Discharge Elimination System	NPDES	
Voluntary Cleanup Program	VCP	New York State Department of Environmental Conservation
Brownfield Cleanup Program	BCP	
Inactive Hazardous Waste Disposal Site (State Superfund)	IHWDS	
State Pollutant Discharge Elimination System	SPDES	

Data for USEPA (federal) program sites (including CERCLA, Resource Conservation and Recovery Act [RCRA], Toxic Release Inventory [TRI], and Air Quality Subsystem [AIRS] Facility Subsystem [AFS]) were obtained in two datasets: USEPA State Combined Facility Registry System (FRS) Facilities (http://www.epa.gov/enviro/html/frs_demo/geospatial_data/geo_data_state_combined.html) and the USEPA Geospatial Data Access Project (http://www.epa.gov/enviro/geo_data.html). These data sets were downloaded on March 21, 2012, and March 8, 2012, respectively. The USEPA State Combined FRS Facilities were matched with additional program and supplemental program information from the USEPA Geospatial Data Access Project and NYSDEC data, also downloaded on March 21, 2012.

These details were consolidated into a single database that provides program information for each site identified in the USEPA programs above, and imported into geographic information system (GIS). Data gathered were queried to report results located within the HDR Area. CERCLA and RCRA sites are shown in Figure 4-24, and AFS and TRI sites are shown in Figure 4-25. Sites identified in the figures are also described in Appendix A, Tables A-1 and A-2, respectively.

Data for NYSDEC (state) program sites (i.e., remediation sites) including VCP, Brownfield Cleanup Program (BCP) (New York State), and State Superfund[4] sites (IHWDS) were obtained on March 13, 2012, from a NYSDEC public FTP Site, available at ftp://ftp.dec.state.ny.us/der/FOIL/. The NYSDEC database is updated daily. Data obtained were then imported into GIS and confined to the limits of the HDR Area. Data gathered were queried to report results located within the HDR Area. The NYSDEC remediation sites are shown in Figure 4-26 and are described in Appendix A, Table A-3.

4.2.2 Spills and Releases within the HDR Area (NYSDEC Spills Database)

Approximately 90 percent of the annual 16,000 environmental releases reported across the state to the NYSDEC involve petroleum products (NYSDEC 2012h). Federal and state laws require the spiller or responsible party to notify government agencies of all petroleum spills within 2 hours of discovery except those which are: 1) known to be less than 5 gallons; 2) contained spills; 3) spills that have not and will not reach the State of New York's water or land; and 4) spills that are cleaned up within 2 hours of discovery (NYSDEC 2012h). The response by the NYSDEC Spill Response Program, including immediate response as well as continued cleanup, varies depending on the type of material spilled and the damage caused.

NYSDEC Spills data were obtained on March 13, 2012, from the NYSDEC FTP site available at ftp://ftp.dec.state.ny.us/der/FOIL/. The data obtained included NYSDEC Spills data for the entire state of New York, and were in the form of two datasets: 1) ALLSPILLS, which included locations of each documented spill, but no materials or quantities reports; and 2) ALLMATS, which included a listing of materials and quantities spilled during each

[4] NYSDEC State Superfund sites are commonly abbreviated "SS," "HW," and "IHWDS." This report and supporting documents use "IHWDS," or "Inactive Hazardous Waste Disposal Sites."

documented spill, but no spill location reported. The datasets as downloaded did not provide geospatial data or a consistent formatting system for spill addresses that is needed to positively identify documented spills within the HDR area.

In order to produce a comprehensive list of documented spills that have historically and/or are currently potentially impacting Newtown Creek, the ALLSPILLS and ALLMATS datasets were combined into a single dataset and narrowed to data within the New York City Boroughs of Brooklyn and Queens. Within this dataset, spills with documented releases of 1,000 gallons or more were extrapolated and included in Table A-4 (in Appendix A). Table A-4 may include documented spills located outside the HDR area; however, without geospatial data, this is the most comprehensive list available to account for potential historical and current impacts to Newtown Creek.

To produce a figure of documented spills located within the HDR area, the NYSDEC Spills dataset would ultimately need to be geocoded to produce geospatial data. In order to do this, the NYSDEC Spills dataset was first narrowed to spill locations documented within neighborhoods and zip codes that overlap the HDR Area. Spill entries documented within neighborhoods or zip codes bordering the HDR area were also included to ensure a conservative dataset.

Secondly, the dataset was further refined to best fit the geocoding systems' default tolerances. Geocoding, the process of identifying coordinates of a location given its attribute information, assigns a geographic location to an address by matching it to a street database (ESRI 2012). Geocoding system tolerances included spelling sensitivity and minimum match score (i.e., how closely the address matches information in the street database). Typically, in order to make a match there are two to three data fields required (i.e., street, zone, cross-street, etc.; ESRI 2012). Therefore, within the narrowed NYSDEC Spills dataset, documented spills with addresses with more than seven words were checked and edited if necessary to refer to a single intersection, or changed to an estimated address using Google Maps. Also, entries that listed a single street or road (e.g., 46th Rd) were deleted as there was no way of determining where the spill in question occurred along these streets (i.e., the geocoder would not be able to assign coordinates to this location).

Finally, this refined NYSDEC Spills dataset was entered into three geocoding systems (Environmental Sciences Research Institute's [ESRI's] "10.0 North America Geocode Service" [ArcGIS Online], ESRI's "10.0 US Streets Geocode Service" [ArcGIS Online], and http://www.gpsvisualizer.com/geocoder/). The resulting latitudes and longitudes from each geocoding system were then compared site by site to verify consistency and accuracy. Sites (or spill locations) where the resulting latitudes or longitudes from two geocoding systems differed by more than 0.0001 degree (approximately 100 feet) were deleted from the dataset. The final NYSDEC Spills dataset of documented spills within the HDR area is shown in Figure 4-27 and listed in Table A-5 (in Appendix A).

Occasionally, the geocoders could not define coordinates for spill addresses that appeared to be located within the HDR area. These documented spills were marked as an "Unrecognized Location"[5] and included in Table A-5. Spill locations deleted due to the 0.0001 degree discrepancy as described above were also still included in Table A-5.

4.2.3 Chemical Use and Bulk Storage Areas (NYSDEC Petroleum Bulk Storage/Chemical Bulk Storage Database)

Aboveground storage tanks (ASTs) and underground storage tanks (USTs) containing petroleum and hazardous chemicals must meet minimum standards established by the USEPA and NYSDEC. The NYSDEC regulates petroleum and chemical storage facilities through the Bulk Storage Program (BSP). This program includes permits for Petroleum Bulk Storage (PBS), Chemical Bulk Storage (CBS), and Major Oil Storage Facilities (MOSF). PBS facilities with a combined storage capacity of greater than 1,100 gallons are required to register with the NYSDEC, and must renew their registration every 5 years (NYSDEC 2012g). MOSFs, designated as terminals or vessels with a capacity of 400,000 gallons or more, must obtain an operating license and comply with license conditions and New York State PBS regulations, as well as implement a spill prevention control and countermeasure (SPCC) plan (NYSDEC 2012f). The CBS program regulates chemical tanks and covers more than 1,000 listed substances, including requirements for release reporting, response, and corrective action (NYSDEC 2012e).

[5] Documented spills marked "Unrecognized Location" may be located outside the limits of the HDR Area.

The NYSDEC bulk storage data were obtained on March 21, 2012, from a NYSDEC FTP site available at ftp://ftp.dec.state.ny.us/der/FOIL/. The data search area was limited to within a 100-foot buffer of the HDR Area. CBS, MOSF, and PBS sites are shown in Figure 4-28 and are listed in Table A-6, located in Appendix A.

4.3 Study Area Data

There have been several previous environmental investigations of the Newtown Creek Study Area. Previous investigations have included data collection efforts for sediment, surface water, and ecological conditions. Since the 1980s, investigations have been conducted by several parties, including the Newtown Creek AOC Respondents (Respondents), NYSDEC, NYCDEP, and USEPA. A summary of existing information was presented in the RI/FS Work Plan and was used to support the determination of the Phase 1 RI field activities. As described in the RI/FS Work Plan, the DQO process will be used as the project progresses to evaluate existing data, clarify the objectives of data collection, and maximize efficiency during the data collection process. Data that have been identified and will be evaluated for inclusion in the RI/FS database include:

- Phelps Dodge Refining Corporation (PDRC) – Draft Remedial Investigation Report Operable Unit 6 Laurel Hill Site, May 2007
- USEPA – Expanded Site Inspection Report Newtown Creek, July 2009
- NYCDEP – Maintenance Dredging Newtown Creek and Whale Creek Canal, July 2009
- NYCDEP – Newtown Creek Waterbody/Watershed Facility Plan Report, June 2011 (the RI/FS Work Plan references the 2007 draft report)

4.3.1 Sediments

A summary of available Study Area sediment data was provided in the Newtown Creek RI/FS Work Plan and includes investigations conducted for specific areas and work performed throughout the main portion of Newtown Creek. Sample locations are shown on Figure 4-33. Recent work investigating sediment has included OU6 RI activities performed by the PDRC in an upper portion of Newtown Creek, work performed by NYCDEP at the mouth of Newtown Creek and in Whale Creek in preparation for the NYCDEP proposed maintenance dredging, and work performed by USEPA in the main portion of Newtown Creek, but not of

the headwaters of the tributaries. These investigations are presented in the following reports as summarized in the RI/FS Work Plan (AECOM 2011).

4.3.1.1 OU6 Remedial Investigation

The OU6 RI was conducted in four phases from 2004 to 2005. The investigation included 72 surface sediment, 48 sediment cores, and 72 pore water (up to 4 seasonal rounds at select locations) sample locations in English Kills, the East Branch, Maspeth Creek and Newtown Creek as shown on Figure 4-33. Surface sediment samples were analyzed for target analyte list (TAL) total metals, TAL pore water metals, acid volatile sulfide (AVS) and simultaneously extracted metals (SEM), total organic carbon (TOC), ammonia, sulfide, grain size, and total solids. At the sediment core locations, the surface samples were also analyzed for target compound list (TCL) volatile organic compounds (VOCs), TCL semi-volatile organic compounds (SVOCs), and TCL pesticides or polychlorinated biphenyls (PCBs). Select samples were also analyzed for dioxins. Subsurface sediment core samples were analyzed for TAL total metals, total solids, TOC, ammonia, sulfide, and grain size. Select samples were analyzed for dioxins and radioisotopes. Results of the OU6 RI indicated the presence of a wide range of metals, hydrocarbons (including PAHs), PCBs, pesticides, plasticizers (e.g., phthalates), and other constituents.

This data set was assessed for its use in RI, RA and FS activities. This data set was transmitted to the project database from PDRC in June 2011. Supporting documentation, such as original lab electronic deliverables, validation reports, and sampling reports, was obtained. The OU6 RI data set is classified as DU-1 and is considered acceptable for all RI, RA, and FS uses, based on the MDAC (Section 3.1).

4.3.1.2 NYCDEP Maintenance Dredging Sampling

In March and April 2009, NYCDEP conducted sediment sampling in preparation for maintenance dredging at the mouth of Newtown Creek and at Whale Creek to allow access for sludge barges (AECOM 2011). During this sampling program, samples were taken in Newtown Creek at four locations from the proposed dredge material (upper segments) and future exposed sediments (lower segments) and in Whale Creek at three locations from the proposed dredge material and at four locations in the future exposed sediments. All sediment

samples were analyzed for physical parameters (e.g., TOC, percent moisture, and grain size), VOCs, SVOCs, metals, pesticides, herbicides, PCBs, dioxins/furans, and conductivity. Proposed dredge area samples were also analyzed using TCLP. Two elutriate samples were analyzed for VOCs, SVOCs, metals, pesticides, herbicides, PCBs, and dioxins/furans (one location). Sediment results were compared to NYSDEC Technical & Operational Guidance Series (TOGS) screening levels. The majority of samples demonstrated the presence of metals, PAHs, PCBs, and dioxins. Some samples had detections of select pesticides and VOCs.

This data set was assessed for its use in RI, RA, and FS activities. This data set was transmitted to the project database in June 2011 in lab-generated PDF format. Supporting documentation was unavailable. Location, sample depths, supportive sample information and validation information were unavailable. Reporting limits were provided; however, method detection limits were not documented.

The NYCDEP data set is classified as DU-2 and may be used for certain aspects of evaluation with the approval of the appropriate project manager, based on the MDAC (Section 3.1).

4.3.1.3 USEPA Expanded Site Inspection

The USEPA conducted an expanded site inspection (ESI) of Newtown Creek in 2009 as part of the hazard ranking system (HRS) scoring process for consideration for placement of Newtown Creek on the National Priorities List (NPL). Between February and April 2009, samples from 74 surface (0-2 feet) and 63 subsurface (2-6 feet) sediment locations were collected from the Study Area and 6 surface and 6 subsurface sediment locations were sampled at the USEPA-selected background location within the nearby Atlantic Basin. The investigation focused primarily on the Study Area and not the full length of the tributaries (the headwaters of Dutch Kills, Whale Creek, Maspeth Creek, East Branch, and English Kills were not sampled). The Atlantic Basin and Study Area samples were analyzed for TAL metals, TCL VOCs, SVOCs, PCBs, dioxins/furans, TOC, and grain-size distribution. Based on the results of the ESI, USEPA concluded that metals, VOCs, SVOCs including PAHs, and PCBs are present in the Study Area sediments at concentrations above the concentrations of constituents in samples that USEPA collected in the Atlantic Basin. The data showed that

constituents with concentrations above the concentrations in the Atlantic Basin samples were not confined to any particular area, but were present throughout the Study Area, from the navigable portion of English Kills to the mouth of Newtown Creek. Additionally, the ESI concluded that the variety and distribution of the detected constituents suggested a variety of sources. The site was listed on the NPL in September 2010.

This data set was assessed for its use in RI, RA, and FS activities. This data set was transmitted to the project database in June 2011 in a USEPA-generated electronic format. Supporting documentation was unavailable. Analytic methods and validation documentation were unavailable. Quantitative limits were provided, but were not adequately documented. Reporting and method detection limits are uncertain.

The USEPA SI is classified as DU-2 and may be used for certain aspects of evaluation with the approval of the appropriate project manager, based on the MDAC (Section 3.1).

4.3.2 Surface Water

The NYCDEP surface water studies and other previous surface water investigations available for the HDR are described as follows. Surface water sampling locations are shown on Figure 4-34.

4.3.2.1 New York Harbor Surveys

Water quality monitoring within New York Harbor has been performed since 1909 and monitoring near the mouth of Newtown Creek began in 1968 (AECOM 2011). Monitoring within Newtown Creek was performed from 1984 to 1999 at Station E2A and four additional stations (NC0, NC1, NC2, and NC3) were added in 2003 and 2004. Water quality sampling is conducted on a monthly basis during winter months and weekly during summer months; monitoring is reported on an annual basis. At this time, without full supporting documentation, this data set is classified as DU-2 and may be used for certain aspects of evaluation with the approval of the appropriate project manager, based on the MDAC (Section 3.1).

4.3.2.2 Newtown Creek Water Quality Facility Planning Project

NYCDEP monitoring began with the 1980 monitoring program of Newtown Creek and its tributaries in support of an application for modification of requirements for secondary treatment at the Newtown Creek WWTP under *Clean Water Act* Section 301(h) (AECOM 2011). In 1989 and 1990, dry and wet weather surveys and special studies were performed to characterize water quality conditions and identify sources of impairments for NYCDEP's Newtown Creek Water Quality Facility Planning Project (AECOM 2011). Water quality data were also collected in Newtown Creek and its tributaries during 1993 as part of an Air Curtain Pilot Study for NYCDEP's City-Wide Floatables Study (URS 2003). At this time, without full supporting documentation, this data set is classified as DU-2 and may be used for certain aspects of evaluation with the approval of the appropriate project manager, based on the MDAC (Section 3.1).

4.3.2.3 OU6 Remedial Investigation

Two rounds of surface water sampling were conducted in 2004 during the OU6 RI. Nearly all of the chemicals analyzed for were either undetected or detected at maximum concentrations that were below New York State chronic water quality criteria (AECOM 2011). Select pesticides and a single VOC (tetrachloroethene) were detected in the water column at concentrations exceeding water quality criteria. This data set was assessed for its use in RI, RA and FS activities. This data set was transmitted to the project database from PDRC in June 2011. Supporting documentation, such as original lab electronic deliverables, validation reports, and sampling reports, was obtained. The OU6 RI data set is classified as DU-1 and is considered acceptable for all RI, RA, and FS uses, based on the MDAC (Section 3.1).

4.3.2.4 NYCDEP Maintenance Dredging Sampling

As part of the pre-dredging assessment, NYCDEP conducted surface water sampling at an outgoing tide within Newtown Creek and Whale Creek to provide data representative of background conditions prior to dredging (AECOM 2011). Copper was the only chemical that exceeded the NYSDEC surface water standards. At this time, without full supporting documentation, this data set is classified as DU-2 and may be used for certain aspects of

evaluation with the approval of the appropriate project manager, based on the MDAC (Section 3.1).

4.3.2.5 NYCDEP Newtown Creek Waterbody/Watershed Facility Plan Report

The results of surface water sampling between 1984 and 2003 were discussed in the NYCDEP draft *City-Wide Long Term CSO Control Planning Project, Newtown Creek* report, submitted to NYSDEC in June 2007. This report was updated in June 2011. Reporting of water quality results focused on dissolved oxygen, floatables, bacteria, and water column toxicity testing. Findings of the report conclude that dissolved oxygen levels do not meet the SD classification for surface water year round. In addition, the report discusses the reduction of total and fecal coliform, which do not apply to the SD classification (no surface water contact) to target the next classification (Class I), and floatables to meet the narrative water quality standards. These constituents and the floatables are of greater issue at the headwaters of Newtown Creek and its tributaries. At this time, without full supporting documentation, this data set is classified as DU-2 and may be used for certain aspects of evaluation with the approval of the appropriate project manager, based on the MDAC (Section 3.1).

5 UPLAND SITE SUMMARY PROCESS

As part of the DAR, site summaries were developed for 91 upland sites: 75 non-Respondent sites and 16 Respondent sites (see Appendices B and C for the completed site summaries). The initial selection of upland sites for summary was identified by searching for upland sites within the HDR Area having one of the following site types: USEPA RCRA large quantity generator (LQG), NYSDEC site or other HDR site (e.g., SPDES-permitted site). This search resulted in 150 upland sites (DCP Table 4-1). From this list, preliminary site summaries were produced by AECOM for 71 sites, which are presented in the Site Summaries – Historical Data Review section of the DCP. For the initial DAR effort, summaries for 75 non-Respondent sites (which include all but three of the preliminary site summaries included in the DCP) and 16 Respondent sites were prepared. Anchor QEA prepared the summaries for the non-Respondent sites (Appendix B), while Respondents prepared site summaries for Respondent sites identified (Appendix C).

Table 5-1 provides the original list of 150 sites (i.e., DCP Table 4-1 – Names of NYSDEC Sites, USEPA RCRA LQG Facilities, and Other Historical Data Review Sites in Newtown Creek HDR Area). Table 5-2 and Figure 5-1 include the current DAR sites, adjusted from the 2011 DCP list. The DCP list was modified in November 2011 when it became apparent that several sites on the list were included twice and should be consolidated. In some cases, changes in property boundaries and ownership over time resulted in two listings for a single site; in other cases, state and federal regulatory programs identified sites by multiple names. It is important to note that site summaries have not been prepared for all sites within the HDR Area, and potential sources not yet identified may exist within this boundary.

5.1 Site Summaries

The purpose of the site summaries was to identify current and historical sources of COPCs to the Study Area and transport mechanisms from the sites to Newtown Creek. Based on available documentation, site summaries contain general site information (location, physical description, and project status); owner and operations history; current and historical site uses; areas of concern (upland, overwater, and spills); soil and groundwater conditions and investigations; surface water; stormwater and wastewater systems and permit information; air releases; and a summary of remediation history.

Site summary development included a comprehensive review of historical documentation gathered during the data collection process. Examples of site documentation include site characterization and investigation reports; remedial investigation reports; sampling and laboratory reports; spills records and reports; discharge monitoring reports (DMRs); site diagrams; maps and figures; an Environmental Data Resources, Inc. (EDR), report for the Study Area; historical and current permits; and historical Sanborn Insurance Maps for the Boroughs of Queens and Brooklyn, New York.

In order to obtain existing and readily available documentation, several addition sources of information were reviewed including the USEPA Envirofacts database and the NYSDEC Spills, Environmental, and Bulk Storage databases. Online web applications, GIS data, and historical file indices were also reviewed for historical site information.

The site summaries are based on information received as of March 2012. Additional information related to individual sites likely exists and can be incorporated into these evaluations in the future. The site summaries can be found in Appendices B and C.

5.2 Identification of Sources and COPCs

USEPA's number one risk management principal states that significant direct and indirect ongoing sources should be identified and controlled if they have the potential to cause recontamination at sediment sites (Horinko Lamont 2002). A goal of the Newtown RI/FS is to identify and, to the extent such information is available, quantify significant loadings of COPCs and sources of such loadings to the Study Area surface water, sediments, groundwater, and biota, and in the case of ongoing upland sources, refer future investigation of sources to the appropriate regulating agency (i.e., USEPA, NYSDEC, or NYCDEP).

Indirect sources of upland contamination can include hazardous materials in drums; tanks; waste piles; surface impoundments and landfills; widespread use of chemicals in general, including fertilizer, pesticides, and herbicides; and heavily impacted media, such as contaminated soil and groundwater that migrate to the creek. Direct sources from an upland property can include direct discharges from industrial facilities (including those prior to environmental regulations) and overwater spills directly to a water body during loading or unloading processes.

Sources can be historical or current. Historical sources are those sources that previously existed, releasing COPCs into the creek, but are no longer present. Understanding historical sources is helpful when evaluating chemical distribution present in subsurface sediment through the RI/FS. Current sources are either historical or current releases of COPCs that may be presently migrating to the creek and require evaluation to determine if a source control measure or action is necessary to mitigate an ongoing source to the creek.

5.3 Potential Migration Pathways

COPCs released to environmental media (groundwater, soil, and air) may migrate via various pathways to Newtown Creek. The six pathways described in the following sections provide potential transport mechanisms to Newtown Creek that are capable of transporting COPCs from an upland site to the creek. Figure 5-2 provides a schematic of the pathways discussed.

5.3.1 Overland Transport

Overland transport occurs when spilled materials, contaminated surface soils exposed in the upland areas, or COPCs used during operations at a site are entrained in stormwater sheet runoff that drains to the creek. Typically, overland transport occurs at sites with impervious surfaces and limited collection systems where site topography provides for flow to the creek. Overland transport can include actual spills of COPCs that flow overland to the creek.

5.3.2 Bank Erosion

Bank erosion occurs when COPCs exist in bank media (e.g. soil, debris, fill materials) and the COPCs are released to Newtown Creek through bank erosion. Susceptibility to bank erosion increases when erodible soils are exposed to wind, surface water runoff, lack of stabilizing vegetation and shoreline armoring (such as riprap), and over-steepened banks. Shorelines that are currently armored with riprap, sheetpiling, concrete walls, or other bulkheads may have been susceptible to bank erosion historically. Shoreline armoring or the presence of stabilizing vegetation can reduce the potential for bank erosion, but if bank structures are in disrepair or vegetation is distressed, migration of impacted materials to the creek can still occur.

5.3.3 Groundwater

Groundwater may provide a COPC transport mechanism when contaminants present in groundwater (nonaqueous phase liquid [NAPL] or dissolved phase contaminants) flows from under an upland site to Newtown Creek. Contaminants present in groundwater may also infiltrate into sub-grade conveyance systems (e.g., storm drains or pipes). Pipe beds, underground utility corridors, and higher porosity fill can also provide a preferential pathway for COPCs in groundwater migrating to the creek.

5.3.4 Direct Discharge – Overwater Activities

Direct discharge from overwater activities occurs when COPCs are released directly to Newtown Creek during site operations that occur over water, such as maintenance and repairs at creek-side docks, wharves, and piers. Discharges from vessels (e.g., gray, bilge, and ballast water), fuel releases, and spills during loading or unloading of bulk dry or liquid cargo operations are also considered overwater activities.

5.3.5 Direct Discharge – Stormwater/Wastewater

Direct discharges through stormwater and wastewater conveyance systems discharging to Newtown Creek can provide a transport mechanism for COPCs present in stormwater or wastewater originating from an upland site. Discharge may occur via a direct pipe connection to the creek.

5.3.6 Discharge via a Combined Sewer Overflow Event

Discharge via CSO outfalls to Newtown Creek can occur if COPCs are present in stormwater or wastewater and are conveyed to a combined municipal sewer system during times when storm flows exceed the hydraulic capacity of the conveyance pipe. See Section 4.1.3.2 for further information.

5.3.7 Atmospheric Deposition

Atmospheric deposition occurs when COPCs are emitted to the air from a variety of sources, such as industrial facility emissions and engine emissions (e.g., automobiles and trains), and from common materials (e.g., plastics, paint) through off-gassing. These air emissions may be

transported over long distances, generally in the direction of prevailing winds. Air pollutants have the potential to be deposited to Newtown Creek in several ways—through wet or dry deposition (precipitation or as particles, respectively) and either directly or indirectly (directly to the creek or first deposited on land and then transported to the creek via surface water, stormwater runoff, or wind in the form of dust).

5.4 Pathway Status

To evaluate COPC pathways from upland sites, the following criteria were applied at each site to assess the relevancy of the existing documentation and the viability of the pathway to transport COPCs from the site to Newtown Creek.

- Category a: A complete pathway
  Exists when specific evidence is present for a transport mechanism to the creek and specific evidence indicates COPCs are in relevant media.
- Category b: A potentially complete pathway
  Exists when reasonable lines of evidence are present for a transport mechanism and reasonable lines of evidence indicate COPCs are in relevant media that together can form a reasonable weight of evidence approach using professional judgment.
- Category c: Insufficient evidence to make a pathway determination
  Exists when no specific evidence is present for a transport mechanism or no specific evidence indicates COPCs are in relevant media. This pathway designation can occur when information is missing or lacking to draw a firmer conclusion.
- Category d: Pathway is not complete
  Exists when specific evidence indicates that there is no transport mechanism from the site to Newtown Creek or the pathway is simply not present (e.g., bank erosion at an inland site not on the creek).

5.5 Source Table

The Source Table provides key information from the site summaries (e.g., historical and current site uses and associated COPCs, including COPCs detected in site investigations), as well as the pathway classification assigned to the site per the pathway criteria described in the previous section. Complete and potentially complete migration pathways were identified in the site summaries, and this information is further summarized in Table 5-3. The air

deposition pathway evaluation resulted in an insufficient determination because, while in several instances information related to current or historical air emissions was located and evaluated, there is not enough information to determine if those emissions are or did reach the creek. As previously mentioned, additional information could become available that would change these initial pathway designations.

5.6 Respondent Sites[6]

This section provides brief summaries of respondent sites within the Newtown Creek drainage area. Respondents' full site summaries are included at Appendix C.

5.6.1 Phelps Dodge Refining Corporation Laurel Hill Site (DAR Site ID 16)

The Phelps Dodge Refining Corporation (PDRC) Laurel Hill Site, an area of approximately 37 acres, is located in Maspeth and abuts Newtown and Maspeth Creeks. The Laurel Hill Site was used for chemical production, copper smelting, and copper refinery operations between the 1870s and 1984. Previous and other owners included G.H. Nichols & Company, Nichols Chemical Company, Nichols Copper Company, Allied Chemical Company, and General Chemical Company.

PDRC's parent acquired Nichols Copper Company as of 1930 and renamed it PDRC in 1938. The Laurel Hill Site currently is undergoing various stages of industrial/commercial redevelopment. PDRC currently retains ownership of approximately 15 acres of the Laurel Hill Site. Other owners include: Sagres LLC, Jump Street, LLC, Spencer Investment Ltd, JSB Equities, New Found LLC, and 56th Road and 43rd Street LLC.

PDRC has entered into four Orders on Consent with NYSDEC and performed extensive investigative and remedial work at the Laurel Hill Site. PDRC completed an initial removal action of approximately 12,000 cubic yards of soil and concrete (excavated and disposed off site) from the southeastern portion of the Laurel Hill Site under NYSDEC's oversight by 1987. From 1999 to 2000, decommissioning and demolition of the Laurel Hill Site structures was undertaken in accordance with a NYSDEC-approved work plan.

[6] Each site summary in this section regarding a Respondent's site was prepared by the current individual Respondent and represents the status according to that person.

In 2000, a RI to define the nature and extent of any contamination resulting from historical activities on the Laurel Hill Site (including soil sampling, soil gas sampling, and groundwater sampling) was completed. A FS, finalized in 2002, explored alternative actions that would minimize or eliminate potential impact on public health and/or the environment posed by the Laurel Hill Site. Based on the results of the RI/FS, NYSDEC selected a remedy, which included physical containment of soils (capping); "hot spot" removal of polychlorinated biphenyls (PCBs) and petroleum-contaminated soil with off-site disposal; groundwater extraction, containment, and treatment; institutional controls; and a long-term cap inspection/maintenance program and groundwater monitoring program. The selected remedy is documented in a 2003 Record of Decision (ROD).

The soil-removal remedial action was completed in 2004. During this period, approximately 21,000 tons of PCBs and petroleum-contaminated soils were excavated and disposed off site. Construction of the groundwater extraction, containment, and treatment system was completed in April 2007. PDRC reports that the operation of the groundwater extraction, containment, and treatment system prevents discharge of contaminated groundwater to Newtown Creek from the Laurel Hill Site and has effectively eliminated the only significant contaminant-migration pathway from the Laurel Hill Site to Newtown and Maspeth Creeks.

As of 2009, approximately 14 of the total 37 acres have been capped with a site-specific cap consisting of asphalt pavement or are covered with new buildings. PDRC continues to work with NYSDEC regarding uplands site capping plans scope and approvals. The New York State Department of Transportation (NYSDOT) Kosciusko Bridge reconstruction project may impact the Laurel Hill uplands site and capping schedule. Based on the current projected schedule, capping should be completed in 2013.

5.6.2 Former Texaco Terminal and the Apollo Street Parcel (No Dar Site ID)

The Former Texaco Terminal and the Apollo Street Parcel are located along the southern bank of Newtown Creek between Meeker Avenue and Apollo Street. The combined size of both properties is approximately 14.2 acres with the Former Texaco Terminal accounting for 11.2 acres. From 1934 to 1958, the Paragon Oil Company operated a petroleum marketing terminal that distributed finished products. From 1958 to 1968, Texaco operated a petroleum

marketing terminal that distributed finished petroleum products. Terminal operations peaked in the 1960s and included the storage of 6.1 million gallons of finished petroleum products, with more than 64 percent of the tankage used for the storage of No.4 fuel oil, No. 6 fuel oil, and lubricating oils. The remaining tankage was used for the storage and distribution of diesel fuel, kerosene, and leaded gasoline. The facility was sold in 1968 to the current property owner. The terminal was demolished in 1968 and a liquor distribution warehouse was constructed on the site. The Apollo Street Parcel is located adjacent to the Former Texaco Terminal, and Texaco neither owned nor maintained operations on the property. Historical operations on the Apollo Street Parcel included a former NYC trash incinerator. The property is currently leased as a liquor distribution facility.

In 1991, 23 years after Texaco ceased terminal operations, a petroleum seep appeared along the bulkhead where the former Texaco Terminal had been located. Through 2004, ExxonMobil completed seep mitigation activities on the former Texaco property. Texaco entered into a Consent Order with the NYSDEC in 2005 that was amended in 2009, to include the adjacent Apollo Street Parcel. In June 2005, Texaco began a detailed phased approach to delineating the extent and determining the source of the subsurface petroleum on the former terminal property and the adjacent Apollo Street Parcel. In 2005, light non-aqueous phase liquid (LNAPL) was seeping into Newtown Creek along 427 feet of bulkheaded shoreline. Remedial action activities have focused on containing and collecting both LNAPL and groundwater in the seep area. These activities have included the installation of a 360-foot grout wall along the former terminal property to contain LNAPL, sealing seams in the steel bulkhead fronting the former terminal property, resurfacing the bulkhead on the Apollo Street Parcel, and installing an impermeable barrier along a 67-foot section of the bulkhead.

Interim land-side recovery of LNAPL began in 2005 as site characterization and remediation system design activities were completed. In September 2007 a full scale total fluids recovery system began operation immediately land-side of the seep. Through June 2010, a total of 41,322 gallons of LNAPL have been recovered from the 13 recovery wells and the LNAPL seep has been effectively mitigated along 100 percent of the initial 427 seepage front. Texaco reports that the system continues to operate and maintains an effective hydraulic control.

5.6.3 BP Brooklyn Terminal (DAR site ID 48)

In 1968, Amoco Oil Company (currently BP) purchased a ten-acre parcel of property from Mobil Oil Company. The parcel, located at 125 Apollo Street, was a portion of a much larger property that had been used for petroleum refining operations, dating back to the mid-1800s, known as the former Standard Oil Company of New York (SOCONY) (later Mobil Oil Corporation) Brooklyn Refinery site. All above ground structures related to the refinery operations had been removed prior to the purchase by Amoco Oil Company. After purchasing the parcel, Amoco constructed a new bulk fuel storage terminal, which began operation in 1970 and continues in operation today. Products are transported to the site via barge and pipeline, stored in a number of ASTs, and are transported off the site via truck and barge. The storage capacity of the terminal is 5,902,512 gallons. The terminal has been used to store diesel fuel, No. 2 fuel oil, kerosene, gasoline, and ethanol.

Following the 1978 US Coast Guard (USCG) observation of oil sheen on Newtown Creek from a property abutting Newtown Creek at the end of Meeker Avenue, BP, the USCG, and NYSDEC, among others, established the Meeker Avenue Task Force to work on a collaborative basis to address the seep along Meeker Avenue. Working under the direction of NYSDEC, BP also initiated petroleum product recovery on the BP Brooklyn Terminal Property as early as 1980. To enhance product recovery, BP has installed additional recovery wells and expanded its recovery system several times.

BP's efforts to maximize free phase petroleum recovery continue today and are currently governed by a comprehensive Consent Order entered into by NYSDEC and BP in 2006. That Order acknowledges that the volume of petroleum product under the BP Brooklyn Terminal Property due to historical refinery operations has resulted in impacts to the soil and groundwater beneath the BP Brooklyn Terminal Property. Remedial operations have removed more than 50 million gallons of groundwater and more than 3.4 million gallons of free phase petroleum product from beneath the BP Brooklyn Terminal Property. Because natural lithologic boundaries and the bulkhead construction limit the potential for a groundwater pathway between the BP Terminal Property and Newtown Creek, there have not been any historical or current seeps into Newtown Creek identified from the BP Brooklyn Terminal Property.

5.6.4 National Grid: Greenpoint Energy Center (DAR Site ID 32)

The Greenpoint Energy Center consists of approximately 117 acres on the west bank of Newtown Creek. The southern boundary of the site lies approximately 500 feet north of English Kills. Roughly one sixth of the site was created from the fill dredged from the removal of Mussel Island and the realignment of Newtown Creek in the mid-1920s. Byproduct coking operation began on this site in 1928. The Greenpoint manufactured gas plant (MGP) produced manufactured gas, and functioned as an MGP and byproduct coking operation until 1952. The facility included a water gas plant, coke ovens, an ammonia plant, and a byproducts plant. Up until the mid-1980s, Greenpoint produced substitute natural gas as well. The coking operations have been decommissioned. Greenpoint currently is an operations center for National Grid (formerly Brooklyn Union Gas) and operations include a liquefied natural gas facility, a service center, and a distribution warehouse facility.

Based on a USEPA Preliminary Assessment (PA) for the site in 1986, USEPA concluded that no further remedial action was planned (NFRAP), pursuant to CERCLA and archived the site. Since that time, the site has had activities under two New York State orders. The first order was a VCP for the remediation of four non- contiguous parcels related to the upgrading of LNG operations within the Greenpoint Energy Center in Brooklyn, New York, which resulted in an Interim Remedial Measure (IRM) for the northeast corner of the site. The second is an Order on Consent and Administrative Settlement, as modified on May 22, 2008, under which current site activities are being performed. An RI for the site is expected to begin in 2012. Data from Phase 1 of the RI will be used in conjunction with existing site data to determine the need for a bulkhead barrier system, or other mitigative measure, related to the potential release of NAPL from the site.

An investigation performed on the northeast corner of the site as part of the upgrade of the LNG liquefaction/vaporization facility found hardened weathered tar. Implementation of IRM activities commenced in April 2005 and concluded with restoration activities in June 2005. The completed IRM work effort included removal of approximately 7,000 cubic yards of impacted soils that were classified as non-hazardous waste and removal of approximately 400 tons of debris. There has been a supplemental IRM related to LNG expansion which commenced on June 2006 and concluded with restoration activities in December 2007. The

completed IRM work effort included removal of approximately 4,700 cubic yards of soil and associated debris.

5.6.5 National Grid: Equity Works Site (DAR Site ID 33)

The Equity Works Site, formerly owned by National Grid, is comprised of three parcels of land owned by third parties, totaling approximately two acres, and is located between 222 and 254 Maspeth Avenue. It is not contiguous to Newtown Creek, with its borders approximately 500 yards to the south and west of the English Kills. The Equity Works MGP began operations in the early 1900s with gas generation, gas storage and purifier house processes in place. Support facilities included coal storage/delivery facilities and miscellaneous tar and oil storage capacity, including tar separators, drip tanks, and gas oil tanks. The plant was developed to its maximum extent around 1921. By 1932 the relief holder was partially decommissioned and by 1933 gas manufacturing equipment had been removed. Brooklyn Union Gas owned the property until approximately 1951 and has had no interest in the property since. Subsequently, the Equity Works Site was used for storage for the period between 1965 and 1981, and appears to have been vacant during the period between 1986 and 1988. Portions of the site have been used as a solid waste transfer facility from 1990 to the present under the ownership of various parties. Two of the parcels are currently used by their owner as a transfer facility and for vehicle maintenance, with the third parcel vacant. Following a PA in 1986, USEPA concluded that no further remedial action was planned at that time, pursuant to CERCLA and archived the site within USEPA's CERCLA Program. The Equity Works site was included in a May 22, 2008 Order on Consent between National Grid and NYSDEC to investigate and remediate hazardous substances believed to exist at the Equity Works Site. The Order requires a RI/FS of the site; National Grid has recently completed the field work associated with the RI.

5.6.6 ExxonMobil: Greenpoint Petroleum Remediation Project (DAR Site ID 53)

Petroleum refining operations in the northeast section of Greenpoint, between North Henry Street, Norman Avenue, and Newtown Creek, began in approximately 1866. By 1870, over 50 refineries were located along the banks of Newtown Creek. In 1892, the Standard Oil Trust purchased many of the refineries along Newtown Creek. In 1911, the Standard Oil Trust was dissolved, resulting in the spin- off of 34 companies, including SOCONY, which

later became Mobil Corporation. Refinery operations at Mobil's Brooklyn refinery ended in 1966, and the refinery was demolished. Significant portions of the former refinery property were sold to various companies for continued industrial use, including a large parcel sold to the American Oil Company (Amoco, currently BP). Mobil used the property it retained as a petroleum bulk fuel storage and distribution terminal until 1993. ExxonMobil was formed with the merger of Exxon Corporation and Mobil Corporation in 1999.

ExxonMobil has been actively engaged in remediation activities in Greenpoint on a continuous basis since 1979. These activities were initiated voluntarily by ExxonMobil immediately after the discovery by the USCG that oil was seeping into Newtown Creek from the bulkhead located at the northern terminus of Meeker Avenue. ExxonMobil and other oil companies identified as potentially responsible parties assisted the USCG with its investigation efforts. At that time ExxonMobil began product recovery operations on its own property and participated in the Meeker Avenue Task Force recovery operations at the foot of Meeker Avenue. Based upon the results of the investigation completed by the USCG in 1979, the free product plume volume was estimated at 17 million gallons. ExxonMobil has recovered in excess of 10 million gallons of product, with majority of product recovery from systems installed and operated by ExxonMobil. The hydraulic control provided by ExxonMobil's systems is also having the beneficial effect of addressing multiple other sources of off-site contamination that are not attributable to ExxonMobil but are present due to the long industrial history of the area. As a result of these hydraulic control measures implemented by ExxonMobil, ExxonMobil reports that there is now no seepage through any of the ExxonMobil controlled bulkheads in the Greenpoint Area. Based upon the prior investigations and ongoing monitoring, NYSDOH has concluded that there is no evidence of petroleum vapor intrusion from the plume into homes in the Greenpoint area. ExxonMobil continues to monitor soil vapor conditions throughout the area on a regular basis in accordance with a monitoring plan approved by NYSDEC. ExxonMobil has also implemented, with NYSDEC approval, a soil vapor mitigation system as a proactive preventative measure in a portion of the commercial-industrial area of Greenpoint.

ExxonMobil has reached an agreement with the State of New York regarding the remediation of contamination associated with its historical operations in Greenpoint. The Consent Decree provides for ExxonMobil not only to continue its current efforts to

remediate and reduce the size of an underground petroleum plume, but also establishes a comprehensive framework for remediation and containment of soil, groundwater and vapor.

5.6.7 Former Pratt Oil Works (FPOW) (DAR Site ID 56)

The Former Pratt Oil Works (FPOW) encompassed approximately 18.5 acres located south of Review Avenue adjacent to the north shore of Newtown Creek in Long Island City. FPOW was determined to have been owned by a predecessor of ExxonMobil between 1892 and 1949. The FPOW operated primarily as a paraffin wax refinery. The development of the property that became FPOW appears to have commenced in the early 1850s as the North American Kerosene Gas Lamp Company. The Asphalt Mining and Kerosene Gas Company set up a factory along Newtown Creek, Long Island City in 1854.

The company later changed names to North American Kerosene and Lighting Company. In or about July 1876, Charles Pratt & Company acquired the property under the name of the Pratt Long Island Refinery (Pratt Oil Works). Historical information indicates that a Queens County Oil Works was present at the property before an acquisition by Charles Pratt. SOCONY acquired the FPOW refinery in approximately 1892. SOCONY operations may have included the manufacturing of wax, lubricating oils, and burning oils; grease compounding; and a cooperage facility. SOCONY ceased operations in 1949. By 1954, much of the FPOW was razed, with the exception of four buildings and a smoke stack, and subsequently was divided and redeveloped.

The property has since been subdivided into 16 lots of Block 312. The parcels that constitute the FPOW have changed ownership over the years. Following FPOW operations the property was redeveloped for industrial activities including but not limited to petroleum, chemical, gravel, manufacturing, and warehousing/storage operations. The FPOW is located in a designated Industrial Business Zone and current uses include municipal waste transfer, warehousing, vehicle storage, restaurant oil and grease recovery and recycling, valve manufacturing and design, stocking of residential and commercial building supplies for distribution, commercial refrigeration supply distribution, cleaning and maintenance products manufacturing, retail lumber and building supply distribution, manufacturing of furniture pads and moving equipment, and wholesale beverage distribution.

ExxonMobil agreed to perform a site characterization even though there were several decades of industrial operations including petroleum-related operations before and after ExxonMobil owned the property. IRM feasibility testing was proposed to NYSDEC in 2009; the findings and results of LNAPL recovery feasibility study events conducted in 2009 were summarized for NYSDEC in a 2009 report.

5.6.8 Former Gulf Oil Terminal (Former Terminyx Corp. and Former Ditmas Oil Assoc. Inc.) (DAR Site ID 123)

The former Gulf Oil Corp. site covers approximately 7 acres, and is located in Brooklyn along English Kills. The site is situated with the BCF Oil site to the west, ABF UPack moving to the east, and the Greenpoint Energy Center to the north.

Gulf Oil Corp. operated on the site from 1945 to 1985 as a bulk fuel storage facility. Terminyx Corp. operated on the site from 1985 to 1998, and Gaseteria Oil Co. / Ditmas Oil Terminal operated on the site from 1998 to 2004 as a petroleum bulk storage terminal.

During Ditmas Oil Terminal operations, petroleum products were brought in from barges on English Kills and via the Buckeye pipeline. ASTs and USTs were utilized for fuel storage. Gasoline was the primary product stored at the facility, along with kerosene, diesel, and No. 2 Fuel Oil in smaller volumes.

Ditmas Oil Terminal was decommissioned between February 2004 and June 2005, at which time approximately 20 tanks, along with underground piping, were demolished and removed from the site. A 2000-gallon fuel oil UST remained for heating the onsite office building.

The site is currently used by the New York City Marshals as an automobile impound lot.

There are two documented spills from the site. One was a surface spill into secondary containment in 1990 that reportedly reached the English Kills (spill number 9006603), and the second was a spill from an underground pipeline in 1999 (spill number 9812647). The NYSDEC file for Spill Number 9006603 remains open. Both spills occurred after Gulf operations ceased.

Remedial efforts on the site are ongoing, and have been performed by CEUS Engineering since 2004 on behalf of Ditmus Oil. Characterization and remediation efforts have included the installation of monitoring wells, interim LNAPL recovery and a bioremediation system which was installed by current owner Malu Properties, Inc in June 2005.

5.6.9 NYC Sites

The sites discussed below were identified in Table 4-1 of the Data Collection Plan (Anchor QEA, 2011a) by virtue of the site being designated under one of the following regulatory programs: USEPA RCRA large quantity generator (LQG), NYSDEC site or SPDES-permitted site. None of the sites described below were discussed in the RI/FS Work Plan under Section 2.2.1.4., "Industrial Sites within the Newtown Creek Watershed," and with the exception of the former New York City Department of Sanitation incinerator located at 1 Kingsland Avenue in Brooklyn, none of the sites described below were identified by USEPA in its April 6, 2010 Notice of Potential Liability Letter to New York City.

Because of high school laboratory experiments and/or indoor construction work to remove asbestos, PCBs, or lead from existing school buildings that are located in the in the area, two public schools received RCRA generator numbers and were included in Table 4-1 of the Data Collection Plan (Anchor QEA, 2011a). Bushwick Educational Campus is two miles from Newtown Creek and Grover Cleveland High School is one mile from the Creek. Upland site investigations revealed that these schools had no history of using hazardous substances or performing industrial processes, with the exception of remediating PCB caulk, asbestos, and lead from the inside the buildings, and educating students using routine experiments in the schools' science laboratories. All of these substances were removed from the schools and disposed of properly by a third party. Because there are no potential COPCs associated with these two sites, they are not discussed further in this Section or elsewhere in the DAR.

The remaining sites that were identified in Data Collection Plan Table 4-1 are described below.

5.6.9.1 Troutman St Venturi Flow Chamber (DAR Site ID 10)

The Troutman metering chamber was a sidewalk vault, accessed by a metal plate hatch, approximately 0.5 miles from Newtown Creek in Brooklyn, the chamber was a small square-shaped concrete vault roughly eight feet by eight feet, and the concrete floor of the chamber was roughly ten feet below the sidewalk surface. The chamber was constructed most likely in the 1940s specifically for monitoring water pressure and flow on the single nearby water main. The meter inside the chamber was constructed of cast iron and stood approximately five feet tall. The top of the meter held the metering gauges, the center of the column held a reservoir of elemental mercury, and the bottom was a solid metal base.

The chamber was taken out of service in the 1970s. In 2006, a spill of elemental mercury was reported to DEC during DEP's decommissioning of the chamber. Remedial investigation revealed that the mercury was localized in the substrate. Remedial work at the chamber began on January 31, 2006, and continued through June 2006. The work progressed from removal of the debris and metering equipment remaining in the chamber to addressing the impacted soils within and underneath the chamber. The remedial excavation work was completed when DEC concurred that the TAGM soil guidance levels were met or the remediation had achieved the lowest levels achievable without jeopardizing the nearby building.

Groundwater was not encountered during remedial work; groundwater levels were recorded as below remedial investigation horizons. Based on the limited equipment and past usage of the facility, the elemental mercury used in the meters was the only constituent of concern.

The remedial excavation work was completed when DEC concurred that the TAGM soil guidance levels were met or the remediation had achieved the lowest levels achievable without jeopardizing a nearby building. Additional remediation would have required excavating towards an adjacent residential building, which was deemed a possible danger to the building foundation and chamber structure. After approval by DEC, closure of the chamber was accomplished by backfilling the chamber and concreting the sidewalk access plate.

5.6.9.2 Newtown Creek Wastewater Treatment Plant (DAR Site ID 11)

The Newtown Creek Water Pollution Control Plant (WPCP) occupies 53 acres on Greenpoint Avenue in the Greenpoint section of Brooklyn, New York. The Newtown Creek WPCP collection system serves over one million residents within a 15,656 acre drainage area. The plant commenced operations in 1967 with an initial flow from Brooklyn and Queens. Manhattan flow was added in 1968 with the completion of the Manhattan Pumping Station, located at Avenue D between East 12th Street and East 13th Street. Treated plant effluent is discharged into the East River via a 12-foot diameter outfall in the bed of the River, as permitted by NYSDEC under a SPDES permit.

The WPCP is currently completing $5 billion extensive upgrade that enabled the Plant to achieve secondary treatment and otherwise improved water quality. When completed, the upgrade will increase the plant's wet weather treatment capacity from 620 mgd to 700 mgd. The upgraded Newtown Creek WPCP includes improved operating systems, expanded electrical power capacity, new transformers, new disinfection systems, new digesters and centrifuges, new pumping stations, and new aeration, sedimentation and sludge storage tanks. The WPCP's disinfection systems have been completely reconstructed to more efficiently eliminate pathogens in the treated effluent.

A portion of the current WPCP site was previously owned first by Standard Oil, and then by Mobil Oil Company, from 1912 to 1997. During part of that time, the site contained ten large oil storage tanks approximately eighty feet in diameter. After localized free petroleum product was discovered at the site, Mobil installed a product recovery system in 1990 and removed approximately 59,000 gallons of free product. During construction of the WCPC upgrade, the City excavated this area to a depth of 35 feet to remove petroleum contaminated soil and installed waterproof sheeting to minimize the impact of dewatering activities on existing groundwater flow due to the presence of off-site LNAPL plumes.

Another portion of the site was previously owned by Exxon Oil Company, from an unknown date to 1997. This area was used as a terminal for the storage and distribution of gasoline, and was developed with twenty below-grade storage tanks which were reported in 1996 to have been closed in place. In 1990, Exxon conducted a subsurface investigation of this site, which revealed the presence of petroleum-related constituents including benzene, toluene,

ethylbenzene, xylenes (BTEX), and T-butyl methyl ether (MTBE). Also in 1990, Exxon/Mobil entered into two consent orders with NYSDEC and began upgrades to the various recovery systems, including the design and construction of a new and expanded system to recover the free product from off-site areas. In 1996, Exxon installed a soil vapor extraction system/air sparging system to reduce VOCs in soil and groundwater.

5.6.9.3 Greenpoint Marine Transfer Station and Incinerator (No DAR Site ID)

The site is adjacent to Newtown Creek and occupies approximately 6.3 acres, of which approximately 3.5 acres is upland. The site is bounded by Newtown Creek to the north, Whale Creek Canal to the west, Kingsland Avenue (Green Street) to the south and North Henry Street to the east. Prior to the City's acquisition of the site in 1908, a manufacturing facility and oil storage terminal occupied the site. An 1887 report from the Brooklyn Department of Health noted that leaking tanks and pipes were observed on the site and that some of the leaking product was escaping containment and migrating into the creek.

The City (Street Cleaning) acquired and began using the site in 1908. In the 1940s, the New York City Department of Sanitation (DSNY) built an incinerator on the site, which burned municipal solid waste. The incinerator closed in 1994 and was demolished in 2004-05. In addition, a DSNY Marine Transfer Station (MTS) operated on the site between 1956 and 2001. The MTS, constructed over the water, transferred loose (not compacted or containerized) municipal solid waste from trucks to open hopper barges for transport to City landfills. Bottom ash residue from the incinerator was also transferred to barges at the MTS.

Currently the former MTS building is used as a DSNY warehouse, storing plows, waste baskets, and other materials. In addition, a 50,000-square foot warehouse building and two tented structures on land are likewise used for DSNY supply storage, and several construction-type trailers are also on the site. NYCDEP also uses the site for construction staging for the Newtown Creek WPCP.

DSNY excavated and removed petroleum-contaminated soil found during the construction of current warehouse building. The City separately removed the former 5000-gallon UST that had failed a tightness test, but found no evidence of a petroleum release from the tank.

5.6.9.4 Borden Avenue Bridge (DAR Site ID 12)

The original Borden Avenue Bridge over Dutch Kills was a wooden bridge built as part of the general construction of Borden Avenue in 1868, connecting East Second Street in Long Island City with D Street in Blissville and to Greenpoint Avenue. In 1874, the wooden bridge was replaced by an 'Iron Swing Bridge' as part of a streets and avenues improvement program. The Iron-Swing Bridge was removed in 1906 and construction began shortly thereafter on a new retractile bridge, a bridge with a superstructure designed to move horizontally either longitudinally or diagonally from "closed" to "open" position, the portion acting in cantilever being counterweighted by that supported on rollers. This new bridge opened on March 25, 1908. The deck's original design consisted of creosote-treated wood blocks, with two trolley tracks in the roadway. The retractile bridge remains in service today.

In 2008, the New York City Department of Transportation (NYCDOT) conducted emergency repair work to the bridge's west abutment. A cofferdam was installed to allow for dewatering. Originally, the soil contamination discussed was to be addressed through excavation and disposal as contaminated, but non-hazardous, material. Then, during the cofferdam excavation, sediment and surface water contamination was discovered from a historic spill of unknown origin within the cofferdam installed for the west abutment reconstruction. Surface water that seeped into the cofferdam also exhibited similar historic contamination. In 2009, NYCDOT developed a Corrective Action Plan and executed a Stipulation Agreement with NYSDEC.

In lieu of a complete State Pollutant Discharge Elimination System (SPDES) permit application, NYSDEC permitted the submittal of a SPDES Permit Equivalent Application. NYSDEC established surface water discharge standards based on the contamination present in the sediments and water. All remediation activities were conducted in accordance with the NYSDEC approved Corrective Action Plan dated July 23, 2009 and amended August 19, 2009, and January 7, 2010. The water treatment system successfully treated the water generated through dewatering, which met the NYSDEC-required surface water discharge limits during all effluent sampling events. A total of 7,390.75 cubic yards of petroleum-contaminated excavated sediment was generated on site and transported to Clean Earth of Carteret for disposal using non-hazardous material manifests for tracking purposes. A total

of 12,152,173 gallons of water were treated and discharged to the Dutch Kills. As part of the Corrective Action Plan a 60-mil thick HDPE liner was installed at the bottom of the west abutment prior to the placement of concrete. This membrane was placed in order to prevent upward migration of petroleum-containing sediment once the cofferdam was removed. After completion of remediation activities, the spill was closed by NYSDEC on March 3, 2011.

5.6.9.5 Maspeth (DAR Site ID 35)

The Maspeth site is an approximately 2.8-acre site in a heavy manufacturing district in western Queens, at 57-15 49th Street, between 56th Road (Clinton Avenue) and Galasso Place. The site is approximately 1,800 feet to the east of Maspeth Creek.

The site is currently a vacant lot that appears to be pervious from aerial maps. It was acquired by condemnation in 1994 by the City for from the Twenty First Century Bus Service Corporation. Upon information, subject to verification, the City never developed or used the site after its acquisition. While the City has been unable to confirm the site's usage before its acquisition, a 2005 Phase II investigation states that the site was operated as an aluminum plant approximately 60 years earlier and more recently operated as a bus maintenance and storage yard, a silkscreen printing facility, and a graphic die cutter facility.

The 2005 Phase II investigation revealed contamination from historic fill and potential contamination from a 20,000-gallon underground petroleum storage tank. The tank was removed in 2008 as an Interim Remedial Measure approved by DEC, and the area around it was filled with clean fill.

5.6.9.6 Queens District 5/5A Garage (DAR Site ID 45)

The site occupies approximately 4.73 acres adjacent to Newtown Creek. The confluence of Maspeth Creek and Newtown Creek is located approximately 0.32 miles northwest of the property. In the 1940s, the site contained a building housing a radio station off Maspeth Avenue (later 58th Road). By the 1980s, two motor freight station buildings were located on the eastern end of the property, off of 48th Street and close to the Maspeth Creek bulkhead.

The City acquired the land in 1987, and in 1989 the DSNY located District 5 and 5A garages on the site. DSNY started using the two garages starting in 1994. The site is currently used for the storage of vehicles used in refuse collection, recycling, street cleaning and snow removal operations. Vehicle maintenance and refueling operations also occur at this facility. A covered salt storage facility is located on the western end of the site. Several petroleum spills have been remediated on this site. A spill of #2 heating oil from a former 2,500-gallon UST is currently open and a Site Specific Investigation Plan is under review by NYSDEC.

A SPDES stormwater permit for the site was issued in 1991. The operation contributing to the discharge flow is described as drainage of stormwater from 58th Road and a portion of 48th Street (Outfall 001) and drainage of stormwater from the site through oil/water separators (Outfall 002). The most recent renewal was January 1, 2009.

6 IDENTIFICATION OF POTENTIAL SIGNIFICANT SOURCES AND DATA GAPS

The purpose of completing the historical data review and identifying potentially significant sources of contaminants to the creek is to have a technical basis for providing recommendations to USEPA on where further evaluation of potential sources is warranted at non-Respondent upland sites; and to help ensure that the in-creek investigation is targeting appropriate areas for characterization. Therefore, in Section 6, Respondents' sites have been excluded because each of the Respondents at their own sites are either: 1) evaluating the need to conduct an uplands evaluation that evaluates potential sources to the creek 2) currently conducting an uplands investigation that evaluates potential sources to the creek, or 3) has completed an investigation and/or subsequent remediation. Respondents therefore have not made a determination of significance for Respondent sites; rather information regarding Respondent sites will be evaluated for inclusion in the RI/FS.

Using the information presented in the site summaries and the Source Table (see Table 5-3), COPC sources from individual sites were classified as either potentially significant or of a currently undetermined significance. By providing an initial determination of significance, it is not intended to indicate that sites of undetermined significance are not of potential significance.

6.1 Determination of Significance and Data Gaps

To designate a site as a source of potential significance or undetermined significance to the creek, each site was evaluated to ascertain if available information provided an indication of a potential concern regarding specific pathways and specific COPC sources to the creek. This evaluation used the material gathered as part of the historical data review in a weight of evidence approach performed using best professional judgment. The process to identified potential sources of significance also identified data gaps.

6.1.1 Sites of Potential Significance

Sites identified as sources of potential significance had several complete or potentially complete pathways to Newtown Creek, and available documentation indicated that these upland sites had an environmental history of operations that could have an impact on the creek. As such, while site impacts described in available documentation indicated that

provided pathways are complete or potentially complete, the characterization of these pathways has not been thoroughly evaluated by the property owner. While several sites have been through various levels of investigation and remediation, oftentimes these evaluations did not include the site's potential impact to the creek. The sites assigned as potentially significant either border Newtown Creek or have a direct connection to the creek, and information related to sources at these sites points to several potentially complete pathways. Further data collection and evaluation (through in-creek or upland investigations and information gathering) are necessary to determine if these sites are significant sources to Newtown Creek.

6.1.2 Sites of Undetermined Significance

Sites identified as being of undetermined significance have potentially complete pathways but insufficient information to determine the potential significance to Newton Creek. Sufficient information characterizing these sites and their connections to Newtown Creek was not available during the site summary process. In some instances, this information is believed to exist and should be reviewed prior to recommendations for additional investigations. In other cases, upland characterizations necessary for the determination of the site's potential impact to Newtown Creek have not been completed. Sites of undermined significance often are not adjacent to the creek and therefore have fewer possible COPC source pathways to the creek (i.e., a pipe connection or groundwater connection are the only possible connections as overwater, overland, and bank erosion pathways are only associated with adjacent sites). This is not to say that a complete groundwater or pipe connection could not be a significant source of COPCs at non-adjacent sites; instead, it is only that enough information was not available to make an informed determination.

Based on available information, preliminary outfall locations and types, and sites that discharge to a stormwater/wastewater conveyance system were compiled. These outfall locations and types are listed in Table 6-1. The outfall locations are estimates based on a culmination of information as described in Section 4.1.3.2 of this report. Outfall types are prescribed as found in existing documentation; definitions for outfall types were not located in available files (see Section 8.1 for a discussion of data gaps). Documented discharges for SPDES permitted outfalls are listed in Table 6-2.

Regional ground water studies and maps were reviewed and are discussed in Sections 4.1.1.5 and 4.1.5.6. Generally groundwater in the region discharges to Newtown Creek and associated waterways or to the East River. However, groundwater flow within the HDR area and at individual sites may differ from the regional pattern due to the extensive development in the areas and the alteration of the subsurface. As a better understanding of local hydrogeology is obtained through the RI/FS, individual upland site shallow groundwater connections should become clearer. Pathways such as groundwater will continue to be evaluated for upland sites.

6.1.3 Sites of Unknown Connection

Several sites summarized as part of the HDR lacked information needed to fully evaluate connections to Newtown Creek. As discussed above in Section 6.1.2 groundwater flow and/or pipe connections to Newtown Creek may exist for several sites; however, site characterizations (e.g. discharge monitoring data, groundwater monitoring data, upland investigations) necessary to make a significance determination or full details of completed characterizations were not available for review. These sites include: ACME Steel/ Brass Foundry, ACME Steel Metal Works, Former Klink Cosmo Cleaners, Soap Manufacturer and Lacquer Storage, Berger Industries, 353 McKibbin Street, Empire State Varnish Co., Inc., Former Spic and Span Dyers, Inc., Goodman Brothers Steel Drum, Kalex Chemical Products, Inc., Outlet City, Pinkas Fischer, and Rencoa, Inc. and Wing Gong Laundry. Additional information is needed to determine whether these sites could pose a significant source to the creek.

6.1.4 Data Gaps

Table 6-3 presents the sites summarized by Anchor QEA and associated data gaps. Data gaps for sites of potential significance are presented as physical (additional characterization has been identified) and informational (additional information is needed). Data gaps for sites of undetermined significance are presented as informational (additional information is needed).

6.2 Upland Sites and Creek Segments

For ease of review and presentation, the Study Area was broken into seven segments. This segmenting is only a form of geographic presentation of summarized information and is not

intended to reflect a benchmark by which future potential segmenting of the creek will be based. Three segments in the mainstem, from downstream to upstream, are identified as Newtown Creek 1 (lower), Newtown Creek 2 (middle), and Newtown Creek 3 (upper). In addition to the mainstem segments, the four tributaries were each segregated as separate segments and include Dutch Kills, Whale Creek, Maspeth Creek, and English Kills. These seven segments are shown on Figure 6-1. Outfalls are presented in Table 6-1 and are geographically depicted in Figures 6-2a through 6-2j. A site's physical location or pipe connection (e.g., stormwater or wastewater or CSO outfall) determined which segment it is tied to and consequently where it is presented in the following sections. A few sites overlapped into multiple segments (e.g., had separate outfall connections to multiple segments or bordered multiple segments). In these cases, the site is listed in each segment. For each creek segment, non-respondent sites determined to be of potential or undetermined significance are listed in the following sections. As discussed above, site significance is directly related to pathway status as summarized in Table 5-3.

6.2.1 Newtown Creek 1 (Lower)

The Newtown Creek 1 segment is at the confluence of the creek with the East River (mouth of the creek) and continues to approximately creek mile 1.5 (see Figure 6-1).

DAR No.	Site Name	Adjacent To Creek	Potentially Significant	Undetermined Significance
50	Motiva Brooklyn Terminal	Yes	Yes	--
106	Buckeye Pipeline Facility	Yes	Yes	--
52	Metro Terminal	Yes	Yes	--
47	Getty Terminals Corp	Yes	Yes	--
125	Hugo Neu	Yes	Yes	--
20	NYCT Crosstown Annex Facility	Yes	--	Yes
42	Roehr Chemicals, Inc.	No	--	Yes
129	LIRR Long Island City Freight Yard (AOC 2)	No	--	Yes
15	TBTA Queens Midtown Tunnel	No	--	Yes
29	Former NuHart Plastic Manufacturing	No	--	Yes
110	Con Edison 11th Street Conduit	Yes	--	Yes

Motiva Brooklyn Terminal, Buckeye Pipeline Facility, Metro Terminal, Hugo Neu and Getty Terminals Corp, ranked as potentially significant source sites associated with Newtown Creek 1. A summary of the sources and pathways identified at these is provided in Section 7. Roehr Chemicals Inc., LIRR Long Island City Freight Yard (AOC 2), TBTA Queens Midtown Tunnel, former NuHart Plastic Manufacturing, NYCT Crosstown Annex Facility, and Con Edison 11th Street Conduit, ranked as having an undetermined significance. Data gaps for these sites include lack of a complete uplands site characterization or more recent information related to remedial actions, and discharge monitoring and sampling data that could inform how the sites may be impacting the creek. See Table 6-3 for the list of identified data gaps.

The following Respondent sites are associated with Newtown Creek 1: Exxon Mobil Greenpoint Remediation Site. Information related to these sites can be found in the site summaries located in Appendix C.

6.2.2 Dutch Kills Segment

The Dutch Kills segment begins at the confluence of Dutch Kills and Newtown Creek and follows Dutch Kills north to its terminus and Dutch Kills creek mile 0.5 (see Figure 6-1).

DAR No.	Site Name	Adjacent to Creek	Potentially Significant	Undetermined Significance
125	Hugo Neu Schnitzer	Yes	Yes	--
5	Con Edison - Newtown Substation	No	--	Yes
6	Confort & Company, Inc.	No	--	Yes
13	NYCT - Kisco Lot	No	--	Yes
17	United Envelope	No	--	Yes
19	Remco Maintenance, LLC	No	--	Yes
58	NYCON Supply Corporation	Yes	--	Yes
102	Amtrak Sunnyside Yard	No	--	Yes

Hugo Neu Schnitzer ranked as potentially significant and is discussed in Section 7. Sites ranked as having an undetermined significance are Confort & Company Inc., Remco Maintenance LLC, NYCON Supply Corporation, Amtrak Sunnyside Yard, NYCT - Kisco Lot,

United Envelope, and Con Edison Newtown Substation. Data gaps for these sites include lack of complete upland site characterizations as well as lack of discharge monitoring and more recent sampling data. This information is needed is needed to determine the source significance of these sites to Newtown Creek. See Table 6-3 for the full list of identified data gaps.

There is one Respondent site associated with Dutch Kills: Borden Avenue Bridge. Information related to the Borden Avenue Bridge site can be found in the site summary located in Appendix C.

6.2.3 Whale Creek Segment

The Whale Creek segment begins at the confluence of Whale and Newtown creeks and follows Whale Creek south to its terminus beyond creek mile 0.1 of Whale Creek (see Figure 6-1).

No sites were identified as having either potential or unknown significance in Whale Creek.

Respondent sites associated with Whale Creek are the Newtown Creek WPCP and the former NYC incinerator. For information on these sites, see the site summaries in Appendix C.

6.2.4 Newtown Creek 2 (Middle)

The Newtown Creek 2 segment begins at creek mile 1.5 and continues down to approximately halfway between Newtown Creek miles 2.2 and 2.3 (see Figure 6-1).

DAR No.	Site Name	Adjacent to Creek	Potentially Significant	Undetermined Significance
41	Review Avenue Development I	Yes	Yes	--
39	Quanta Resources	Yes (easement)	Yes	--
21	NYSDOT Bin 1075910	Yes	--	Yes

Review Avenue Development I and Quanta Resources (aka Review Avenue Development II) ranked as potentially significant sites are discussed in Section 7. The NYSDOT Bin 1075910

site was identified as a site of undetermined significance. Data gaps for this site are discussed in Table 6.3 and include the need for a better understanding of the site's potential pathways to the creek. This information is needed to determine what this site's source significance is to Newtown Creek. See Table 6-3 for the full list of identified data gaps.

Respondent sites associated with Newtown Creek 2 are: Former Pratt Oil Works, BP, Paragon, and Former Phelps Dodge Refining Corp. Information related to these sites can be found in the site summary located in Appendix C.

6.2.5 Newtown Creek 3 (Upper)

The Newtown Creek 3 segment begins approximately halfway between Newtown Creek miles 2.2 and 2.3 and continues to the terminus of the East Branch (see Figure 6-1).

DAR No.	Site Name	Adjacent to Creek	Potentially Significant	Undetermined Significance
59	Empire Transit Mix, Inc.	Yes	Yes	--
114	Fast Processing, Inc.	No	--	Yes
137	PV Knit Goods Processing	No	--	Yes
109	Compudye, Inc.	No	--	Yes
30	Former W.L.K. Corp.	No	--	Yes
2	Barker Bros – Ridgewood	No	--	Yes
134	Pebble Lane Associates	Yes	--	Yes
143	STAR Corrugated Box Co.	No	--	Yes

Empire Transit Mix ranked as potentially significant and is discussed in Section 7. Sites that rank as of undetermined significance are: Fast Processing, Inc., PV Knit Goods Processing, Compudye, Inc., Barker Bros – Ridgewood, Former W.L.K. Corp., Pebble Lane Associates, and STAR Corrugated Box Co. Data gaps for these include lack of complete upland site characterizations and of more recent information related to complete or ongoing remedial actions, discharge monitoring and sampling data, as well as information regarding connection to Newtown Creek. This information is needed to determine the significance of the sites to the Creek. See Table 6-3 for the full list of identified data gaps.

Respondent sites associated with Newtown Creek 3 are Queens District 5/5a Garage,, National Grid Greenpoint Energy and Former Equity Works. Information related to these sites can be found in the site summaries located in Appendix C.

6.2.6 Maspeth Creek Segment

The Maspeth Creek segment begins at the confluence of Maspeth and Newtown Creek at Newtown Creek mile 2.4. The segment follows Maspeth Creek to its terminus at Maspeth Creek mile 0.2 (see Figure 6-1).

DAR No.	Site Name	Adjacent to Creek	Potentially Significant	Undetermined Significance
4	Con Edison – Maspeth Substation	No	--	Yes
18	NYCT – Fresh Pond Depot	No	--	Yes
142	S&L Metal Products Corp.	No	--	Yes
144	Structural Processing Corp.	No	--	Yes

No potentially significant sites were associated with Maspeth Creek. The following DAR sites were associated with Maspeth Creek and ranked as of undetermined significance: Con Edison – Maspeth Substation, NYCT – Fresh Pond Depot, S&L Metal Products Corp., and Structural Processing Corp. Data gaps for these sites include lack of complete upland site characterizations and lack of discharge monitoring and sampling data. This information is needed to determine the significance of these sites to Newtown Creek. See Table 6-3 for the full list of identified data gaps.

One respondent site, Maspeth Project, was associated with Maspeth Creek. Information related to this site can be found in the site summaries located in Appendix C.

6.2.7 English Kills Segment

The English Kills segment begins at the confluence of English Kills and Newtown Creek (creek mile 2.8) and extends approximately 1 mile to the terminus of English Kills (see Figure 6-1).

DAR No.	Site Name	Adjacent to Creek	Potentially Significant	Undetermined Significance
59	Empire Transit Mix	Yes	Yes	--
27	B.C.F. Oil Refining, Inc.	Yes	Yes	--
51	Bayside Fuel Oil Depot	Yes	Yes	--
60	Morgan Oil Terminal	Yes	Yes	--
130	Manhattan Poly Bag	No	--	Yes
31	Frito Lay	Yes	--	Yes
46	Waste Management of New York – 123 Varick Avenue	Yes	--	Yes

Empire Transit Mix, B.C.F. Oil Refining, Inc., Morgan Oil Terminal, and Bayside Fuel Oil Depot were ranked as having potential significance and are discussed in Section 7. Sites identified as having an undetermined significance are Manhattan Poly Bag, Frito Lay, and Waste Management of New York – 123 Varick Avenue. Data gaps for these sites include lack of complete upland site characterizations and lack of discharge monitoring and sampling data. This information is needed to determine the significance of these sites to Newtown Creek. See Table 6-3 for the full list of identified data gaps.

There is one Respondent site associated with English Kills: Former Gulf Oil Corporation - Greenpoint Bulk Plant. Information related to the Former Gulf Oil site can be found in the site summary located in Appendix C.

7 POTENTIALLY SIGNIFICANT SOURCE SITES

7.1 Motiva Brooklyn Terminal (DAR Site ID 50) – Summary

The site occupies approximately 7.5 acres in Brooklyn. The site is adjacent to the Pulaski Bridge and Newtown Creek at creek mile 0.6. Prior to 1930, the site was occupied by the Forest Box and Lumber Co. Since the 1930s, it has been used for petroleum storage and distribution. Potential historical and current contaminant sources at the site include USTs, ASTs, underground pipelines, upland spills, ancillary operational equipment and facilities, fuel loading rack, marine terminal diesel rack, Tosco fleet maintenance area, and releases during product transfer from vessels. The identified COPCs for these sources include benzene, toluene, ethylbenzene, and xylene (BTEX), total petroleum hydrocarbon (TPH), VOCs, SVOCs, PAHs, and metals.

The following pathways were identified for the site:

- Complete pathways:
  - *Current:* Stormwater/wastewater discharge, overwater activities,
  - *Historical:* Groundwater, stormwater/wastewater discharge, overwater activities
- Potentially complete pathways:
  - *Current:* Groundwater, overland transport
  - *Historical:* Overland transport, bank erosion
- Insufficient information to make a pathway determination:
  - *Current:* Bank erosion, discharge to sewer/CSO, air
  - *Historical:* Discharge to sewer/CSO, air

Overwater Activities

Current and historical overwater activities at the sites include loading and unloading petroleum products from barges and other vessels. In 1953, the site received petroleum products by barge. Four 6-inch underground pipelines extended from the wharf to storage tanks located on the upland portion of the site. The total tank capacity was 40,950 barrels (USACE 1953c). In 1978, the site received petroleum products by barge, fueling tug, and small vessel. Petroleum products were conveyed to 10 steel storage tanks with a capacity of

38,100 barrels (USACE 1978). In 1988, the 10 steel storage tanks were connected to the interstate pipeline of Buckeye Pipeline Co (USACE 1988). In 1999, the site received deliveries of petroleum products by barge (USACE 1999). A spill of hydraulic oil from a contractor's barge was documented in 2008. Overwater activities is a complete current and historical pathway.

Bank Erosion

Historically, there was a timber bulkhead with concrete-surfaced solid fill along the 633-foot shoreline; this was retrofitted in 2006 with a sheetpile bulkhead and new concreted deck (USACE 1932, 1953c, 1965a, 1988, 1999). A dredging permit application for the site noted release of rock fill from behind the bulkhead into the creek due to bulkhead deterioration (S.T. Hudson Engineers Inc. 2006). In 2006, a new bulkhead extending to -30 feet MLLW was constructed at the site (S.T. Hudson Engineers Inc. 2006). Soil and groundwater contamination have been identified on the site, and are discussed in detail in the next section. Bank erosion is a potentially complete historical pathway. There is not sufficient evidence to make a current pathway determination.

Groundwater

Groundwater at the site generally flows north-northeast toward Newtown Creek. Quarterly groundwater monitoring events occurred at the site in the late 1980s and early 1990s. Field investigations at the site occurred in 1995 and 1996 and included soil borings, groundwater monitoring, and sampling at 38 monitoring wells, and soil vapor extraction tests (Handex 1997). Between the late 1980s and 2009, dissolved contaminants including BTEX, methyl tertiary butyl ether (MTBE), and oil and grease were detected in groundwater at the site (SAIC 2009). Light non-aqueous phase liquids (LNAPLs) have been present beneath the site since at least 1990 (EDR 2010). A LNAPL recovery system began operating at the site in 1999. In 2005, the pneumatic pump recovery system was deactivated and LNAPL recovery efforts were limited to manual bailing (Tillman 2007). As discussed previously, a timber bulkhead existed at the site from the early 1900s to 2006 when a new bulkhead was constructed. Groundwater is a historically complete pathway and a potentially complete current pathway.

Stormwater/Wastewater Systems

In 1959, the site was discharging stormwater and wastewater directly to Newtown Creek via two 8-inch-diameter outfalls located under the docks (Hazen and Sawyer 1959). Pre-treatment consisted of two oil-water separators (OWS), which were characterized as "inadequate" in the Comprehensive Plan for the Prevention and Abatement of Pollution published in 1965 (NYSDOH 1965b). Since 1979, discharge from the site has been regulated by a SPDES permit, issued by the New York State Department of Environmental Conservation (NYSDEC). Available files contain discharge monitoring reports (DMRs) that document exceedances of permit limits for oil and grease and BTEX in stormwater discharges to Newtown Creek. Direct stormwater discharge is a complete historical and current pathway.

This site is within the Newtown Creek Water Pollution Control Plant (WPCP) sewershed. When the combined flows exceed the system's capacity, untreated CSOs are discharged to Newtown Creek. There is insufficient evidence to make a current or historical pathway determination for discharge to sewer/CSO.

Overland Transport

No specific evidence of overland transport was identified in the available site records. Several documented spills occurred at the site, affecting both the soil and the surface waters of Newtown Creek. Based on the site topography and proximity to Newtown Creek, stormwater or spilled materials could flow overland towards Newtown Creek. Overland transport is a potentially complete current and historical pathway.

Motiva Brooklyn Terminal – Data Gaps

The site has documented impacts to soil, groundwater, and surface water. Upland field investigations and ongoing monitoring have occurred at the site since the 1980s. Reports from many of these investigations were not included in files available for review. Current operations discharge stormwater and wastewater to Newtown Creek. The historical and current impacts of site-generated COPCs on Newtown Creek have not been evaluated.

7.2 Metro Terminal (DAR Site ID 52) – Summary

Metro Terminal occupies approximately 4.5 acres adjacent to Newtown Creek and was identified as a potentially significant source site. A brief rationale describing how this DAR site was selected is given in Table 6-1 and described in this section.

The Metro Terminal site is a multi-million gallon petroleum storage facility and transfer terminal. It has been in use as an oil terminal since at least 1916 and has been the main office for METRO Energy since 1986. The site receives petroleum products and additives, including diesel, biodiesel, xylene, gasoline, and fuel oil. Upland facilities include a truck loading rack, fueling area, maintenance building, 11 ASTs and 13 USTs. Identified COPCs associated with these areas of concern include gasoline and diesel fuels, fuel oils (1 through 6), xylene, and vinyl acetate monomer, which are discussed in greater detail in the site summary included in Appendix B.

The following pathways were identified for the site:

- Complete pathways:
  - *Historical:* Overland transport, stormwater or wastewater discharge
- Potentially complete pathways:
  - *Current:* Overland transport, overwater activities, stormwater or wastewater discharge
  - *Historical:* Overwater activities
- Insufficient information to make a pathway determination:
  - *Current:* Groundwater, bank erosion, discharge to sewer/CSO, air
  - *Historical:* Groundwater, bank erosion, discharge to sewer/CSO, air

Overland Transport

As described in the site summary, prior to about 1972, the grade at portions of the plant allowed drainage to flow directly to the creek over the top of the existing bulkhead (Metropolitan Petroleum Company 1972). After 1972, collected stormwater passed through an OWS prior to discharge, but no details on system capacity were identified to determine if all site drainage was or currently is captured. Several spills and impacts to soil have been

reported at the site. This provides a complete historical pathway and a potentially complete current pathway via overland transport.

Stormwater/Wastewater Systems

A private sewer equipped with an OWS discharged site runoff to Newtown Creek since at least 1959 (Hazen and Sawyer 1959). Prior to 1972, stormwater at the site was discharged directly to Newtown Creek without treatment (Metropolitan Petroleum Company 1972). The site has had a SPDES permit for stormwater and hydrostatic test water since 1990 (NYSDEC 2011a). Stormwater collected on at least a portion of the site is directly discharged to Newtown Creek via Outfall ST-90. Additional stormwater from the site is collected in on-site yard drains and discharged directly to Newtown Creek through Outfall 001. Toluene and xylene concentrations in the discharge have exceeded the current permit limits by at least two orders of magnitude (NYSDEC 1990). This provides a complete historical pathway and a potentially complete current pathway for direct stormwater and wastewater discharges.

Sanitary wastewater discharges from the site flow into a separate local municipal system. It is likely that the separate sewer system flows into a larger combined system prior to reaching the Newtown Creek WPCP. When these combined flows exceed the system's capacity, untreated CSOs are discharged to Newtown Creek at Outfall NCB-633 (NYCDEP 2007a). There is insufficient evidence to make a current or historical pathway determination regarding the presence of COPCs in the discharge via CSO events.

Overwater Activities

Petroleum products were imported to the site by barge and transferred through pipes from the dock to on-site storage tanks (USACE 1953b). Reviewed records did not specifically indicate historical spills associated with barge product transfer overwater activities. A spill was reported in 1996 where sheen, from No. 6 fuel oil, was noted on the surface of Newtown Creek. There is a potentially complete current and historical pathway for overwater activities.

Bank Erosion

No specific evidence of historical or current bank erosion was identified in the available site records. In 1965, approximately 655 feet of timber bulkhead was noted along the site with solid fill and a T-head wharf, with a 36-by-15-foot approach (USACE 1965a). Records from 1999 and 2003 indicate that a timber bulkhead is still in place along the site (USACE 1999). Site plans created in 2003 show a wooden bulkhead along all but approximately 105 feet of the site shoreline (NYSDEC 2003). There is insufficient evidence to make an historical or current pathway determination for bank erosion.

Groundwater

As described in the site summary (Appendix B) this site has operated as a high-volume fuel storage facility since the 1930s and several underground storage tanks are present on the site. In the early 1970s, three areas of oil soaked soil were identified at the site (Metropolitan Petroleum Company 1972). The records reviewed indicate that groundwater monitoring had occurred on the site in the past and may continue but no additional information was available for review. There is insufficient evidence to make a current or historical pathway determination for groundwater.

Metro Terminal – Data Gaps

Site groundwater sampling has reportedly occurred; however, results were not included in files available for review. Records indicate a spill of No. 6 fuel oil occurred on February 22, 1996, producing sheen on Newtown Creek (EDR 2010). Stormwater directly discharges from the site through Outfall ST-90 and Outfall 001 to Newtown Creek, and the site has a SPDES permit for BTEX discharges. Direct stormwater discharges from the site to the creek have occurred via an on-site outfall since at least 1959. A SPDES permit authorizing discharge of stormwater and hydrostatic test water was originally issued to the site in 1990 and was renewed in 1998, 2003, and 2008. Permit parameters include BTEX and MTBE. Monitoring data prior to 2006 were not included in files available for review.

7.3 Getty Terminals Corp. #58220 (DAR Site ID 47) – Summary

The Getty Terminals site occupies approximately 4.1 acres adjacent to Newtown Creek and was identified as a potentially significant source site. A brief rationale describing how this DAR site was selected is given in Table 6-1 and described in the following section.

Beginning around 1898, the Getty Terminal site was used as a lumber yard ending in 1936. Since 1936, the site was used as a gasoline storage and distribution center. The site is currently owned by LukOil and is used for storage and transfer of gasoline products, which it receives by barge and unloads at the wharf moorage area. Identified COPCs for the site associated with current site operations include petroleum hydrocarbons, PAHs, BTEX, VOCs, SVOCs, and metals, which are discussed in greater detail in the site summary included in Appendix B.

The following pathways were identified for the site:

- Complete pathways:
  - *Current:* Stormwater/wastewater direct discharges
  - *Historical:* groundwater, stormwater/wastewater direct discharges, overland transport
- Potentially complete pathways:
  - *Current:* Groundwater, overwater activities, overland transport
  - *Historical:* Overwater activities
- Insufficient information to make a pathway determination:
  - *Current:* Discharge to sewer/CSO, bank erosion, air
  - *Historical:* Discharge to sewer/CSO, bank erosion, air

Stormwater/Wastewater Systems

As described in the site summary, information available for review of the site did not include stormwater management practices prior to 1988. A SPDES permit was issued on February 1, 1988 (Getty 1988), and current stormwater infrastructure at the site manages stormwater discharges through an oil water separator prior to discharge to Newtown Creek. A total of 31 exceedances of the SPDES permit effluent limitations were identified between 1988 and 2009

in available records providing a complete historical and current complete pathway for direct stormwater and wastewater discharges to the creek.

Material reviewed while preparing this summary did not include additional information on wastewater treatment or handling. No outfall or connection to the municipal sewer system was noted for the site in material reviewed. There is information pertaining to sheen on the creek sourced from an underground product line that flowed via a sewer line to the creek. There is insufficient evidence to make a historical or current sewer/CSO pathway determination.

Groundwater

A total of 36 spills were reported on the site since 2001, with 33 affecting soil, one affecting the sewer, one affecting surface water, and one an unknown resource. Available information indicates elevated petroleum-related concentrations in groundwater and NAPL in at least two monitoring wells. A limited amount of groundwater quality information was available for review, and additional groundwater data are needed to evaluate the current groundwater pathway. This provides a complete historical pathway and a potentially complete current pathway for groundwater to the creek.

Overland Transport

The Getty Terminal site slopes gently down from approximately 5 feet above MSL on the northeast site boundary to Newtown Creek. This allows overland sheet runoff to transport COPCs from historical and current spills and leaks from the upland portion of the site to the creek. From 1998 through 2009, there were 36 documented spills at this site. This is a complete historical pathway and a potentially complete current pathway.

Overwater Activities

Site drawings indicate that barges docked at a mooring area that included an area for a single vessel with a serving capacity of 336,000 to 1,050,000 gallons. Reviewed records did not specifically indicate historical spills associated with barge product transfer overwater activities. Based on the transfer of petroleum products from barges, this provides for both an historical and a current potentially complete pathway via overwater activities.

Bank Erosion

No specific evidence of historical or current bank erosion was identified in the available site records. A portion of the shoreline has been bulkheaded since at least 1965, when 214 feet of steel sheet bulkhead fronted with timber fenders was documented by the Board of Engineers for Rivers and Harbors (USACE 1965a). Currently, a sheetpile cut-off wall extends along the approximately 730-foot shoreline of the site (Reich2002), with a relieving platform and wooden bulkhead extending over water where barges are unloaded. Records available for review did not indicate when or why this sheetpile/bulkhead was constructed and what the condition of the shoreline was prior to that. In 2001, a 200-foot portion of the relieving platform collapsed. This included the collapse of an earthen and timber crib along with the overlying asphalt into Newtown Creek. A permit application was submitted in June 2002 (Reich 2002) to replace the relieving platform "in-kind" and was approved by NYSDEC (2002), but further information on impact to Newtown Creek sediment from the collapse or on whether a subsequent repair was completed was not available for review. There is insufficient evidence to make a current or historical pathway determination for bank erosion.

Getty Terminals Corp. #58220 – Data Gaps

The site has a SPDES permit and stormwater discharges from the site to Newtown Creek through Outfall 001, and permit limit exceedances have been noted since the permit's issuance in 1988; however no SPDES or discharge records were available for review. There are numerous reported spills of gasoline product (including the gasoline spill and release to the creek via the sewer line), and the upland characterization information was not available for the site. Further investigation is warranted to determine whether the identified pathways, including groundwater due to the number of recent gasoline spills reported and direct discharge due to the documented permit exceedances, provide a potentially significant source to the creek.

7.4 Buckeye Pipeline Facility (DAR Site ID 106) – Summary

The Buckeye Pipeline Facility occupies approximately 1 acre adjacent to Newtown Creek and was identified as a potentially significant source site. A brief rationale describing how this DAR site was selected is given in Table 6-1 and described in the following section.

The Buckeye Pipeline Facility is used for transfer of petroleum products, including fuel, oil, gasoline, and naphtha to or from oil terminals in the Greenpoint area via primarily underground pipelines (EMS 2004). By 1911, the site was a smaller portion of the larger LIRR Greenpoint Avenue Rail Yard (Sanborn 1911; USACE 1965b). The pipeline started operation on December 9, 1966 (NYC 1967). Potential historical and current contaminant sources at the site include railroad cars and tracks, tanks, pipelines, and ancillary equipment that transport and store petroleum products (including gasoline, fuel oil, and hydraulic oil), batteries, fire suppression foam, and transformer fluid. The identified COPCs for these sources include TPH, BTEX, PAHs, VOCs, metals, PCBs, and other SVOCs, which are discussed in greater detail in the site summary included in Appendix B.

The following pathways were identified for the site:

- Complete pathways:
  - *Historical*: Stormwater/wastewater direct discharge, groundwater
- Potentially complete pathways:
  - *Current:* Overland transport, stormwater/wastewater direct discharge, groundwater
  - *Historical:* Overland transport, bank erosion
- Insufficient information to make a pathway determination:
  - *Current:* Discharge to sewer/CSO, bank erosion, overwater activities, air
  - *Historical:* Discharge to sewer/CSO, overwater activities, air

Bank Erosion

As described in the site summary, LNAPL and dissolved petroleum hydrocarbons have been present beneath the Buckeye Pipeline Facility since at least 1987 (NEPCCO 1987; EMS 2004, 2009). In 1987, the U.S. Coast Guard observed petroleum emanating from the bulkhead at the site. This wooden bulkhead extends along the 250-foot shoreline. NYSDEC referred to this as a petroleum leachate condition. The subsequent investigation resulted in the installation of a groundwater/LNAPL recovery system. Monitoring at the site has continued through at least 2010, but seep observations were not included as part of the ongoing quarterly groundwater monitoring and no additional seep information was identified in the

available site records (NEPCCO 1987). No specific evidence of bank erosion was identified in the available site records. Soil and groundwater contamination has been identified in several areas on the site including the presence of the historical seep described previously (EDR 2010; EMS 2004). This provides for a potentially complete historical pathway to the creek, but there is insufficient evidence to make a complete current pathway determination. Additional information is needed for a complete pathway determination as the onsite NAPL recovery well is in close proximity to the bulkhead, and the bulkhead condition over time is poorly understood.

Groundwater

Groundwater at the site generally flows south/southwest toward Newtown Creek and appears to be influenced by a variety of factors, including seasonal precipitation, varying backfill placement, compaction, ongoing LNAPL recovery operations, and tidal fluctuations (NEPCCO 1987; EMS 2004). The most recent quarterly groundwater sampling data available for review from 2010 indicated LNAPL was present within one recovery well operating on site and that groundwater exceedances for VOCs were noted. This provides a complete historical pathway for groundwater to the creek and a potentially complete current pathway.

Stormwater/Wastewater Systems

As already mentioned a groundwater/LNAPL recovery system has been in operation since 1987 and continued operations through at least 2009. The system was designed to recover and remove gasoline (i.e., LNAPL) from groundwater, and recovered LNAPL is pumped to a 500-gallon tank; groundwater is pumped through granular activated carbon (GAC) canisters prior to discharge into Newtown Creek (NEPCCO 1987; EMS 2004, 2009). The discharge of this wastewater is permitted through the SPDES permit issued to the site by the NYSDEC since 1991 (NYSDEC 1991, 2011a). The site has exceeded permitted effluent limits on several occasions (Mandala 1991; Newman 1992; Rowlett 2006; USEPA 2011).

No stormwater infrastructure was identified on available site drawings or aerial photos. Based on the topography, stormwater at the Buckeye Pipeline Facility is expected to infiltrate into the ground or flow overland towards Newtown Creek. This, combined with the wastewater discharges described above, provides for a historically pathway that is

complete and a current pathway that is potentially complete via stormwater/wastewater direct discharge.

Stormwater and wastewater discharges from the Buckeye Pipeline Facility are possibly also discharged to separate municipal systems. The municipal separate stormwater system discharges to Newtown Creek without treatment through stormwater outfalls that are permitted as MS4s in the WPCP SPDES permits (NYCDEP 2007c). Although wastewater discharges, not related to the groundwater/LNAPL recovery system, from the site may flow into a separate local municipal system, it is likely that the separate local system flows into a larger combined system prior to reaching the treatment plant. When storm flows exceed the hydraulic capacity of the conveyance pipe to discharge in a combined system, untreated CSOs are discharged to Newtown Creek (NYCDEP 2007c). There is insufficient evidence to make a current or historical pathway determination via a CSO event at the Buckeye Pipeline Facility.

Overland Transport

No specific evidence of overland transport was identified in the available site records and based on the site topography, stormwater at the site is expected to infiltrate into the ground or flow overland towards Newtown Creek. Several reported spills have occurred at the site. This provides a potentially complete historical and current pathway to the creek via overland transport.

Overwater Activities

Reviewed information did not specify current or historical overwater activities but did show that the pipeline operated at the site extends into the water and crosses under Newtown Creek (Batson 1965). There is insufficient evidence to make a current or historical pathway determination.

Buckeye Pipeline Facility – Data Gaps

During the site's operations, numerous documented releases to the creek (including SPDES permit exceedances, spills, and visual seep releases) have occurred, and the impact to the creek has not been investigated or was not available for review. While upland investigations have been conducted, identified site COPCs were not fully included in those investigations.

Upland impacts to the site are present, but information related to relative impact to the creek was not available. Further investigation is warranted to determine whether identified pathways provide a potentially significant source to the creek.

7.5 Hugo Neu Schnitzer (aka SIMS Hugo Neu) (DAR Site ID 125) – Summary

The Hugo Neu Schnitzer site occupies a 4.4-acre parcel located adjacent to Newtown Creek at the confluence with Dutch Kills and was identified as a potentially significant source site. A brief rationale describing how this DAR site was selected is given in Table 6-1 and described in the following section.

Historically, barges unloaded manure to freight cars parked on a track laid on the wharf (BPL 1870b; War Department 1916a). Sometime between 1966 and 1970, the docking inlets were filled (Sanborn 1970, 1979b). The site has been used to operate a scrap metal and recyclables yard since approximately 1970. Identified COPCs associated with the site include VOCs, SVOCs, PAHs, TPH, metals, phthalates, and PCBs, which are discussed further in the site summary included in Appendix B.

The following pathways were identified for the site:

- Complete pathways:
  - *Historical:* Stormwater/wastewater direct discharge, overwater activities, overland transport
- Potentially complete pathways:
  - *Current:* Stormwater/wastewater direct discharge, overwater activities
- Insufficient information to make a pathway determination:
  - *Current:* Groundwater, discharge to sewer/CSO, bank erosion, overland transport, air
  - *Historical:* Groundwater, discharge to sewer/CSO, bank erosion, air

Overwater Activities

As described in the Hugo Neu Schnitzer site summary, a bulkhead with space for up to four hopper barges is located along the boundary with Newtown Creek, and material processed at

the site is generally shipped from the site by barge for transport to other facilities for additional processing or re-use. One incident in the past was noted where a barge loaded with scrap sunk overnight. No other incidents of overwater spills were noted. This provides a historical pathway that is complete and a current pathway that is potentially complete via overwater activities.

Stormwater/Wastewater Systems

Stormwater at the Hugo Neu Schnitzer site flows to one of two outfalls via site topography and drainage infrastructure and discharges after passing through an OWS at Outfall No. 1. When stormwater flows exceed the capacity of the site system, excess water is discharged, untreated, to Dutch Kills at Outfall No. 2. The site has held a SPDES permit since at least 2007 with at least one violation of the permit for not collecting annual stormwater samples, incorrectly preserving or analyzing samples, and allowing runoff from machinery to enter a waterway (NYSDEC 2005). Information available for review did not discuss stormwater practices prior to 2003. This provides a complete historical pathway to Dutch Kills or Newtown Creek and a current potentially complete pathway via direct stormwater and wastewater discharge.

Additionally, material reviewed did not include information on wastewater treatment or handling. No outfall or connection to the municipal sewer system was noted for the site in material reviewed. There is insufficient evidence to make either an historical or a current pathway determination for direct stormwater and wastewater discharge.

Overland Transport

During large storm events, overland sheet runoff may transport site COPCs from the upland portion of the site to either Newtown Creek or Dutch Kills. The site was cited for allowing runoff containing automobile shredder residue to enter a waterway (NYSDEC 2005). This provides a historical pathway that is complete, but there is insufficient evidence to make a current pathway determination.

Bank Erosion

The Hugo Neu Schnitzer site is located on the northern side of Newtown Creek at the confluence of Newtown Creek and Dutch Kills. Sometime between 1966 and 1970, the

docking inlets were filled with fill from an unknown source (Sanborn 1970, 1979b). No specific evidence of bank erosion was identified in the available site records, and soil and groundwater contamination in bank areas has not been investigated at the site. The creekside boundaries of the site are protected by a sheetpile bulkhead along the Newtown Creek portion and by a large riprap and sheeting emplacement along the Dutch Kills portion. There is insufficient evidence to make either an historical or a current pathway evaluation for bank erosion.

Groundwater

No groundwater quality or investigation information was found in material reviewed while completing this summary. Regional groundwater flow is to the southwest across the site to Newtown Creek and Dutch Kills (Misut and Monti 1999). There is insufficient evidence to make either a current or historical pathway determination for groundwater. Additional information is needed for a complete pathway evaluation.

Hugo Neu Schnitzer (aka SIMS Hugo Neu) – Data Gaps

No upland site characterization was identified for this site. Stormwater from the site passes through an OWS and discharges directly to Dutch Kills (Outfall 1 and 2). This on-site drainage system will overflow when its capacity is exceeded, and during these events, stormwater will bypass the OWS and discharge directly to Dutch Kills. There have been documented releases of residues or materials from site operations to Newtown Creek and one instance where a loaded scrap barge sunk after being loaded. Artificial fill is present over a significant portion of the site with an unknown fill source. Because the site is in close proximity to Newtown Creek and given the history of releases to Dutch Kills and lack of upland characterization, further investigation is warranted to determine whether the identified complete and potentially complete COPC pathways represent a significant source to Newtown Creek.

7.6 Review Avenue Development I (DAR Site ID 41) – Summary

The Review Avenue Development I (RAD I) site occupies approximately 6.5 acres over three tax lots, separated by the LIRR right-of-way, and was identified as a site of potential

significance. A brief rationale describing how this DAR site was selected is given in Table 6-1 and described in the following section.

The RAD I site is made up of the South Capasso property (Lots 279 and 280) located on the southern side of the LIRR right-of-way and the North Capasso property (Lot 41) located on the north side of the LIRR right-of-way and adjacent to Review Avenue. The North Capasso property (Lot 41) is currently occupied by the Angel Aerial Company, who rents equipment (such as box trucks, cube trucks, water trucks, tractors, cars, lifts, scaffolding, heaters, and air conditioners) to the film and television industry (Angel Aerial 2012). The South Capasso property (Lots 279 and 280) is occupied by Green Asphalt Company, LLC (Green Asphalt), which is a transfer station that handles asphalt waste (NYSDEC 2011c).

Historical site uses of the RAD I site include oil refining, zinc alloy and metal manufacturing, animal rendering, fertilizer manufacturing, coal storage, construction/demolition and asphalt waste management, and vehicle fueling and maintenance. Potential historical contaminant sources at the facility are those associated with current and historical industrial uses of the site. Historical on-site USTs and ASTs were used to store oils, solvents, gasoline, diesel, and tallow (War Department 1884, 1898; Sanborn 1898, 1915, 1950, 1977, 1990b; NYSDEC 2010a). Identified COPCs for these sources include petroleum hydrocarbons, chlorinated solvents, VOCs, SVOCs, metals, PAHs, and PCBs, which are discussed in greater detail in the site summary included in Appendix B.

The following pathways were identified for the site:

- Complete pathways:
  - *Historical:* Stormwater/wastewater direct discharge
- Potentially complete pathways:
  - *Current:* Stormwater/wastewater direct discharge, groundwater
  - *Historical:* Overwater activities, overland transport, bank erosion, groundwater
- Insufficient information to make a pathway determination:

- *Current:* Overwater activities, discharge to sewer/CSO, overland transport, bank erosion, air
- *Historical:* Discharge to sewer/CSO, air

Overland Transport

The southern portion of the RAD I site, adjacent to Newtown Creek, has had numerous COPCs historically detected associated with past industrial uses. However, no specific evidence of overland transport was found in available files. The topography site slopes gently down across the combined RAD I property from approximately 25 feet above MSL along the northeast property boundary on Review Avenue to less than 5 feet above MSL along the southern property boundary on Newtown Creek. This provides a historical pathway that is potentially complete, but additional information is needed to evaluate the current pathway status.

Groundwater

Groundwater at the RAD I site flows to the southwest across the site toward Newtown Creek. Groundwater investigations were conducted at the site during Phase I (1990) and II (1992) investigations, and additional groundwater investigations occurred at the site and the nearby Quanta Resources site (also known as Review Avenue Development [RAD II; DAR Site ID 39]) during the remedial investigation at the site (2003-2005). These investigations confirmed the presence of LNAPL and dissolved contaminants including PCBs, VOCs, SVOCs, PAHs, and metals in the northern portion of the site. In 2005, at the time of the remedial investigation, LNAPL had not been observed in monitoring wells on the southern portion of the site adjacent to Newtown Creek. Based on groundwater elevations measured during the remedial investigation and subsurface materials documented in boring and well logs, the remedial investigation report concluded that a transient groundwater mound existed in the southeastern portion of the site and impeded the migration of LNAPL toward the creek (Golder 2005a, 2005b). On October 5, 2007, a spill was reported at 37-98 Railroad Avenue (southern portion of the site; NYSDEC Spill No. 0707419) and an unknown petroleum product was released and impacted groundwater. This spill is not closed (EDR 2010). This provides both an historical and a current potentially complete pathway to the creek via groundwater.

Bank Erosion

The shoreline of the portion of the site adjacent to Newtown Creek has been bulkheaded since at least the early 1890s with a timber bulkhead and, later, a combination timber bulkhead and sheetpile bulkhead. As described above, documented impacts to site soils and groundwater have been detected on the northern portion of the site and, to a limited extent, on the southern portion of the site adjacent to Newtown Creek. The condition of these various bulkheads over time is not known, and no specific evidence of bank erosion was identified in documents available for review. Historical operations were noted to be located immediately adjacent to the creek. This provides a historical pathway that is potentially complete, and there is insufficient evidence to make a current pathway determination.

Overwater Activities

Historical overwater activities at the site include loading and unloading of materials, including fuel oil, waste oil, tallow, poultry feed, animal carcasses, and fertilizer from barges, tankers, and other vessels. Petroleum products were conveyed to/from the wharf via pipeline across the site to nearby oil refining and re-refining facilities. Tallow was conveyed via pipeline to and from the docks to fat rendering plants located on upload portions of the site (USACE 1926, 1932, 1953c, 1965a, 1978). No specific evidence of releases from overwater activities was identified in documents available for review, and no information was located regarding current overwater activities. This provides a historical pathway that is potentially complete, but there is insufficient evidence to make a current pathway determination.

Stormwater/Wastewater Systems

Historical documents indicate that wastes were discharged from the historical animal rendering facilities to Newtown Creek via an 18-inch-diameter submerged pipe. The wastes were described as animal by-products and drippings from equipment wash-up. This same facility was later investigated for water pollution violations and fined $2,000 for discharging waste from the fat rendering plant into Newtown Creek (NYT 1970). In 1977, the U.S. Coast Guard charged the facility with polluting navigable waters of Newtown Creek (NYT 1977). On December 27, 2006, the NYSDEC issued a SPDES permit to the Green Asphalt Company LLC (Green Asphalt) facility (located at 37-98 Railroad Avenue on Lots 279 and 280). This

provides an historical pathway to the creek that is complete and a current pathway that is potentially complete via direct stormwater and wastewater discharge.

The RAD I site is within the Bowery Bay Water Pollution Control Plant (WPCP) sewershed. Stormwater drains to on-site infrastructure (i.e., catch basins and conveyance piping) and discharges to Newtown Creek (NYSWPCB 1959). Wastewater discharges from the site are conveyed to the WPCP for treatment prior to discharge. When the combined flows exceed the system's capacity, untreated CSOs are discharged to Newtown Creek. Although sanitary discharges from the site flow into a separate local municipal system, it is likely that the separate local system flows into a larger combined system prior to reaching the treatment plant (NYCDEP 2007b). There is insufficient evidence to make either a current or an historical pathway determination for discharge via sewer/CSO.

Review Avenue Development I – Data Gaps

Investigations and limited remedial activities have occurred at the site, with numerous detections noted in groundwater and upland soils, but the current potential impact of the site on the creek has not been evaluated fully. Because the site is in close proximity to Newtown Creek, there is a documented history of releases and discharges to the creek and of overwater activities, and there is documented upland contamination, further investigation is warranted to determine whether the identified complete and potential pathways are a significant source to Newtown Creek.

7.7 Quanta Resources aka Review Ave. Development II (DAR Site ID 39) – Summary

The Quanta Resources aka Review Avenue Development II (RAD II) site occupies approximately 0.2 acre and was identified as a site of potential significance. A brief rationale describing how this DAR site was selected is given in Table 6-1 and described in the following section.

The site is located about 500 feet east of Newtown Creek, and recent aerial photographs indicate that the site is paved and used for parking or storing of tractor trailer trucks. For more than a century, the site supported an oil refinery and performed the recycling, processing, and storing of used and unused oils, solvents, and miscellaneous wastes. In 1981,

the site was abandoned, and NYCDEP officials executed an emergency remedial action at the site (EDR 2010; Woodward-Clyde 1984). Tanks have been historically present on site containing oil, acid, still bottoms, chemicals (including PCB oil), and oil and earth. Identified COPCs for these sources include petroleum hydrocarbons, chlorinated solvents, VOCs, SVOCs, metals, PAHs, and PCBs, which are discussed in greater detail in the site summary included in Appendix B.

The following pathways were identified for the site:

- Complete pathways:
  - *Historical:* Stormwater/wastewater direct discharge
- Potentially complete pathways:
  - *Current:* Groundwater, stormwater/wastewater direct discharge, *Historical:* Groundwater, overwater activities, overland transport
- Insufficient information to make a pathway determination:
  - *Current:* Discharge to sewer/CSO, bank erosion, overwater activities, air, overland transport
  - *Historical:* Discharge to sewer/CSO, bank erosion, air

Overland Transport

The RAD II site is located approximately 500 feet from Newtown Creek. Site occupants have had a 5-foot-wide easement extending from the southwestern corner of the property southwest to Newtown Creek since at least 1931 (Walter R. Ray Holdings Co., Inc. 1967). Pipelines conveyed oil and waste oil between the site and the creek. Several inspections in 1980 by NYSDEC noted oil residue on the ground from leaks at several locations throughout the site; it is unknown if these spills impacted the easement however. Additionally, at least three documented spills occurred on the site which affected the surface soils at the upland property. While no specific evidence of overland transport was identified in materials reviewed, this provides a potentially complete historical pathway to the creek via overland transport, and there is insufficient evidence to make a current pathway determination.

Bank Erosion

A timber bulkhead and later a combination timber bulkhead and sheetpile bulkhead existed along the bank within the easement described above (War Department 1884; USACE 1890, 1926, 1932, 1953c, 1965a, 1978; AACC 1930). No specific evidence of historical or current bank erosion was identified in the available site records. Pipelines conveyed oil and waste oil between the site and the creek via the easement. There is insufficient evidence to make a determination regarding current and historical bank erosion pathways.

Overwater Activities

The RAD II site is not adjacent to Newtown Creek or its associated waterways, but deeds for the property indicate that, since at least 1931, site occupants have had a 5-foot-wide easement extending from the southwestern corner of the property southwest to Newtown Creek and the right to dock "vessels, barges or other carriers" at the bulkhead. The easement was intended for pipelines, conduits, and private utilities (Walter R. Ray Holdings Co., Inc. 1967; 37-80 Review 2005). Two 6-inch-diameter pipelines extended to the wharf from four steel storage tanks (9,500-capacity barrels) located on the RAD II site (USACE 1978). In 1965, fuel oil was delivered by barge and piped from the bulkhead to the site via a 6-inch-diameter pipeline. In 1978, waste oil was shipped from the site by barge (USACE 1965b). No additional information about these activities was identified in documents available for review, and it is not known if the easement is used today for any overwater activities. This provides a potentially complete historical pathway to the creek via overwater activities, and there is insufficient evidence to make a current pathway determination.

Stormwater/Wastewater Systems

The RAD II site discharged untreated stormwater and wastewater from at least the 1930s through to the early 1970s via an 8-inch-diameter discharge pipe that extended from the southwestern corner of the site to Newtown Creek (LMS 1990; Golder 2005b; Diamond 1971; Newman 1971; NYSDEC 1972). In 1972, the site signed an Order on Consent agreeing to abate discharge to Newtown Creek and to submit engineering plans for improvements to the site's existing drainage and sanitary sewer infrastructure and was issued a permit for those improvements (Diamond 1971; Newman 1971; NYSDEC 1972). Schematic site plans created during site investigations conducted in the 1980s indicate that wastewater (sanitary and process) was discharged to the municipal sewer located in Review Avenue (LMS 1990;

Golder 2005b). Information about the current on-site stormwater infrastructure was not identified in documents available for review. This provides a historical pathway to the creek that is complete and a current pathway that is potentially complete for direct stormwater and wastewater discharge.

There is not enough information to make a pathway determination for the RAD II site in terms of historical and current discharge to CSO/sewer systems.

Groundwater

Groundwater flows south/southwest across the RAD II site toward Newtown Creek. By 1982, approximately 80,000 gallons of LNAPL (3 to 7 feet thick) were floating on the shallow, unconfined groundwater at the site. Up to 143 parts per million (ppm) of PCBs were detected in samples collected from the plume (Harrington 1997; Golder 2005b), and the LNAPL plume extended off site to the south. The primary on-site source of LNAPL is the tank farm on the northeastern corner of the site along with an additional LNAPL source from the RAD I site. Dissolved VOCs, SVOCs, and metals were also discovered beneath the site in 1982 and more recent groundwater sampling and analysis conducted between 1988 and 2005 indicate that concentrations of some dissolved VOCs, PAHs, SVOCs, and metals in groundwater at the site exceed the NYSDEC TOGS 1.1.1 Class GA (groundwater) standards and guidance values (Golder 2005b). This provides historical and current potentially complete pathway to the creek via groundwater.

Quanta Resources a/k/a Review Ave. Development II – Data Gaps

A number of investigations and remedial activities have been completed on the uplands portion of the site with numerous detections noted in groundwater and upland soils. The site had an easement to the creek that provided pipeline service. Information available does not indicate that this easement has been characterized. The site discharged untreated stormwater and wastewater from the 1930s through the 1970s via an 8-inch-diameter pipe located in the easement. This easement could be a historical pathway, including a preferential pathway to the creek. Further investigation is warranted to determine whether the identified complete and potentially complete COPC pathways are a significant source to Newtown Creek.

7.8 B.C.F. Oil Refining, Inc. (DAR Site ID 27) – Summary

The B.C.F. Oil Refining, Inc. site occupies 1.9-acre located adjacent to English Kills at creek mile 0.2. In the late 1800s, the majority of the site was an embayment (War Department 1884, 1916, 1930, and 1891). The embayment was filled to the present day-shore line by the early 1930s (War Department 1930; Malcolm Pirnie 2010). Throughout the next four decades, the site was in use as an oil terminal. Site occupants included the Atlantic Basin Oil Co. (ca. 1933), the Morannia Oil Co. Inc. (ca. 1965), and AR Fuels (ca. 1971) (Sanborn 1933, 1965, Chevron 1971). In 1979, the terminal was modified for use as a waste oil processing facility, and was used for waste oil recycling from 1980 to 1994 by Calleia Brothers, Inc., and B.C.F. Oil Refining, Inc. The site is currently a New York City Marshals automobile impound lot (Malcolm Pirnie 2010).

Historic areas of concern include areas in which petroleum transport, storage, and processing occurred, including USTs and ASTs and ancillary equipment, conveyance pipelines, truck loading, and a vehicle repair shop. Current areas of concern include products and equipment used in automobile impound operations. COPCs associated with these areas of concern include PCBs, PAHs, VOCs, SVOCs, chlorinated volatile organic compounds (CVOCs), TPH, and metals.

The large volume of PCB-contaminated waste oil in abandoned tanks, in combination with inadequate secondary containment, and the threat that any release posed to the environment including impacts to English Kills led the NYSDEC to ask USEPA to conduct an emergency removal action (Malcolm Pirnie 2010). USEPA, beginning in May 2000, conducted an emergency response action at the B.C.F. Oil Refining, Inc. site to address concerns about possible leakage from un-maintained USTs, ASTs, and drums. It was noted at that time that the ASTs' secondary containment area had cracks in the walls and only a partial floor. By October 2001, USEPA had removed more than 800,000 gallons of PCB-contaminated oil, wastewater, and sludge from the facility, cleaned and closed-in-place the ASTs and USTs on site, and recycled approximately 65,000 pounds of scrap metal from the site (Malcolm Pirnie 2010).

The following pathways were identified for the site:

- Complete pathways:
  - *Historical:* Groundwater, stormwater/wastewater direct discharge, overwater activities
- Potentially complete pathways:
  - *Current:* Groundwater, stormwater/wastewater direct discharge, discharge to sewer/CSO
  - *Historical:* Discharge to sewer/CSO, overland transport,
- Insufficient information to make a pathway determination:
  - *Current:* Bank erosion, overland transport, overwater activities, air
  - *Historical:* Bank erosion, air

Bank Erosion

The southern boundary of the site is located adjacent to English Kills. The bank adjacent to the site is composed of a 15- to 20-foot-tall retaining wall that runs the length of the southern site boundary with English Kills. No specific evidence of bank erosion was identified in the available site records. Soil and groundwater contamination have been identified in several areas on the site, but there are no specific sampling data from bank soil sampling. There is insufficient information to make a current or historical pathway determination.

Groundwater

The large volume of PCB-contaminated waste oil in abandoned tanks, in combination with inadequate secondary containment, and the threat that any release posed to the environment including impacts to English Kills, led the NYSDEC to ask USEPA to conduct an emergency removal action at this site. In May 2000, USEPA conducted an emergency response action to address concerns about possible leakage from un-maintained USTs, ASTs, and drums. By October 2001, USEPA had removed more than 800,000 gallons of PCB-contaminated oil, wastewater, and sludge from the facility and had cleaned and closed-in-place all ASTs and USTs on site (Malcolm Pirnie 2010).

Groundwater investigations have been conducted at the site since 1992 and have included groundwater monitoring at 17 monitoring wells. Reports from several of these investigations were not included in files available for review. Groundwater at the site flows toward English Kills. Dissolved COPCs detected in groundwater at the site include PCBs, VOCs, PAHs, and metals. LNAPL was observed in on-site monitoring wells at the site in the 1998 and 2007. Additionally, these same COPCs have been found in the sediment adjacent to the site. This provides an historical pathway that is complete and a current pathway that is potentially complete via groundwater.

Overwater Activities

A 90-foot bulkhead described as a timber pile, timber decked, offshore wharf with an 85-foot timber approach existed at the site from the 1930s until the late 1980s (Sanborn 1933, 1965, 1978, 1986a, USACE 1965a). Petroleum products were received by barge. Three 6-inch and one 5-inch pipelines extended from the wharf to 12 underground storage tanks and four vertical aboveground storage tanks. Total tank capacity was 27, 380 barrels (USACE 1965a). Records indicate that the terminal was used in waste oil recycling operations. Terminal operations were listed in the spill prevention plan (BCF Oil Refining 1988). This is a complete historical pathway, and there is insufficient evidence to make a current pathway determination.

Stormwater/Wastewater Systems

Stormwater and wastewater discharges from the site are discharged to separate municipal systems. The southern portion of the site drains to English Kills. The site had an historical SPDES permit (NY-036609), but no specific permit information or sampling results were available in the site records reviewed. A release from the OWS system to English Kills was reported to NYSDEC in 1994. The spill resulted from heavy precipitation that was contaminated with PCBs overflowing the OWS system. NYSDEC contracted to have a bypass installed to allow stormwater to flow directly into English Kills (NYSDEC 1994). No sampling data are available regarding this spill. The northern portion of the site lies within the drainage area of stormwater Outfall ST-22, which is located at the eastern terminus of Maspeth Avenue on Newtown Creek (NYCDEP 2007c). Direct discharge of stormwater and wastewater is a complete historical pathway and a potentially complete current pathway.

In 1959, the Morgania Oil Co. Inc. completed a Wastewater User's Survey for the New York State Water Pollution Control Board. The survey indicated that yard drainage from the site discharged to the city sewer untreated prior to discharge (Hazen and Sawyer 1959).
This site is within the Newtown Creek WPCP sewershed. Wastewater from the site is conveyed to the WPCP for treatment prior to discharge. Although wastewater discharges from the site flow into a separate local municipal system, it is likely that the separate local system flows into a larger combined system prior to reaching the treatment plant. When the combined flows exceed the system's capacity, untreated CSOs are discharged to English Kills or Newtown Creek (NYCDEP 2007c). Discharge to sewer/CSO is a potentially complete current and historical pathway for this site.

Overland Transport

Several documented spills occurred while the site was a waste oil processing facility. As discussed previously, stormwater from the southern portion of the site discharges to English Kills. Overland sheet runoff may transport eroded surface soils and COPCs from historical spills and leaks from the upland portion of the site. Overland transport is a potentially complete historical pathway, and there is insufficient information to make a current pathway determination.

B.C.F. Oil Refining, Inc. – Data Gaps

The site has been in use as an oil terminal for several decades. Petroleum products were received by barge and conveyed to multiple storage tanks located on the upland portions of the site. Between 1987 and 1997, there were numerous documented releases of petroleum products from the site to surface soils, groundwater, and surface water. Historical operations were apparently covered by an SPDES permit (NY-036609). Information about permit conditions and associated monitoring data was not included in files available for review.

Groundwater investigations have been conducted at the site since 1992 and have included groundwater monitoring at 17 monitoring wells. Beginning in 2000, USEPA conducted emergency removal actions at the site to address concerns about possible leakage from un-maintained USTs, ASTS, and drums. Dissolved COPCs detected in groundwater at the site include PCBs, VOCs, PAHs, and metals. LNAPL was observed in on-site monitoring wells at the site in the 1998 and 2007. In 2010, a remedial investigation was conducted at the site.

The primary goal of the remedial investigation was to assess the nature and extent of PCBs, which could have been released to the environment prior to the emergency removal actions. Aroclors 1242, 1248, 1254, and 1260 were detected in one or more of the sediment samples. The remedial investigation also documented widespread petroleum contamination at the site, but it did not evaluate potential impacts of other COPCs to the creek.

7.9 Empire Transit Mix, Inc. (DAR Site ID 59) – Summary

The site occupies approximately 1.8 acres adjacent to Newtown Creek at the confluence with English Kills. The site was historically occupied by the Louis Bossert (lumber yard), United Fuel Company (coal storage and distribution), and several trucking companies (including Quinn Trucking Co, and Transcon Lines). Empire Transit Mix, Inc. occupied the site from the early 1990s to the present and operates a concrete manufacture and distribution facility. Potential historical and current contaminant sources at the site include freight, trucking and coal yard operation, USTs located on site, historical tank failure, aggregate piles, and illicit discharges to the waterway. The COPCs for these sources include TPH, VOCs, PAHs and other SVOCs, and metals.

The following pathways were identified for the site and discussed in greater detail in the site summary (Appendix B) and the following sections:

- Complete pathways:
  - *Historical:* Groundwater, stormwater/wastewater discharge
- Potentially complete pathways:
  - *Current:* Groundwater, overwater activities, overland transport, discharge to sewer/CSO, stormwater/wastewater discharges
  - *Historical:* Discharge to sewer/CSO, overland transport, overwater activities
- Insufficient information to make a pathway determination:
  - *Current:* Bank erosion, air
  - *Historical:* Bank erosion, air

Groundwater

Groundwater flow is to the southeast toward the confluence of English Kills and Newtown Creek (Mackie and Shorter 1996). In 1992, thirteen USTs located in the northeast portion of the site were decommissioned. Evidence of petroleum releases was observed and a soil and groundwater investigation was conducted. During the investigation, LNAPL was observed in two of the four on-site monitoring wells. TPH and VOCs were detected in groundwater samples collected at the site. Upland investigation, soil removal, and NAPL recovery activities occurred at the site. In1997, NYSDEC issued a no further action determination for the investigation of releases from the USTs. Groundwater is a complete historical pathway and a potentially complete current pathway.

Stormwater/Wastewater Systems

Stormwater from the site is conveyed to Newtown Creek and discharged without treatment at Outfall NCB-306 (NYCDEP 2002). Violations and orders issued by NYCDEP from 1999 to 2005 indicate that the site discharged directly to surrounding storm drains that go to Newtown Creek. In 2003, a NYCDEP investigation revealed that a sand trap intended to collect cement particulate from vehicles washed down on the property was illegally discharged to English Kills via the municipal stormwater system. A build-up of cement discovered inside the storm sewer indicated that the discharge had occurred repeatedly (NYCDEP 2003a). Empire Transit Mix, Inc. was required to connect to the sanitary sewer. The site is listed as minor, unpermitted facility in the USEPA's Integrated Compliance Information System. Facilities that are identified in this database, but do not have a NPDES discharge permit, include facilities that are inspected or are recipients of enforcement actions (USEPA 2011). Direct discharge of stormwater and wastewater is a complete historical pathway and a potentially complete current pathway.

The site is located in the Newtown Creek WPCP sewershed. Stormwater and wastewater discharges from the site flow into separate municipal sewer systems. Wastewater is conveyed to the WPCP for treatment prior to discharge. Although sanitary discharges from the site flow into a separate local municipal system, it is likely that the separate local system flows into a larger combined system prior to reaching the treatment plant. When the combined flows exceed the system's capacity, untreated CSOs are discharged to Newtown

Creek (NYCDEP 2007a). To the extent that wastewater discharges are coincident with CSO events, discharge to the sewer/CSO is a potentially complete current and historical pathway.

Overland Transport

Bulk materials, including sand and gravel, are stored in piles at the site. Based on the site topography, stormwater in the eastern and southern portions of the property is expected to flow overland towards Newtown Creek. This is a potentially complete current and historical pathway.

Bank Erosion

The site is adjacent to Newtown Creek. A bulkhead has existed at the site since the early 1900s (War Department 1916, 1930a). No specific evidence of bank erosion was identified in the available site records. Thus, there is insufficient evidence to make a current or historical pathway determination.

Overwater Activities

Currently and historically, the site received materials by barge including sand, gravel, stone, rock, limestone, soil, and dredged material. Therefore, this is a potentially complete current and historical pathway.

Empire Transit Mix, Inc. –Data Gaps

This site has documented upland soil and groundwater contamination that has not been fully characterized. The site is adjacent to the creek on two sides, and groundwater at the site flows in the direction of the creek. Historically, operators discharged stormwater and process wasatewater from on-site concrete mixing operations to the creek.

7.10 Morgan Oil Terminal, Brooklyn (DAR Site ID 60) – Summary

The site occupies approximately 3.52 acres adjacent to English Kills at creek mile 0.8. Historic site uses include brick and lime storage, asphalt manufacture, coal storage and distribution, lumber yard, metal incinerator, wire/sheet metal and wire manufacturer (Sanborn 1907, 1933, 1965, 1979a). Between the late 1940s and the early 2000s, several companies, including Premium Coal and Oil Company and Morgan Oil Terminals

Corporation, operated oil terminals and distribution businesses at the site (USACE 1953; Sanborn 1965, 1979a, 1986a, 1990a).

In the early 1990s Morgan Oil, along with Citifuel (a site lessee) and Premium Pipeline (a subtenant to Citifuel), received several notices of violations and civil penalties related to petroleum storage and handling practices at the site and the New York State Environmental Conservation Law (EDR 2010). These included operating a MOSF without a license, failure to maintain daily tank inventory records, failure to notify NYSDEC of an oil release within two hours and failure to clean up the release per direction from NYSDEC, failure to comply with the SPDES permit requirements, and improper management of petroleum products (EDR 2010; NYSDEC 2012a). Remedial investigations at the site began in 1993 and continue to the present day.

Area of concern at the site include ASTs and USTs, conveyance piping, loading racks and ancillary equipment used in oil storage and distribution, asphalt manufacturing, and coal and salt distribution practices and operations. COPCs for these sources include PAHs, VOCs (including BTEX and MTBE, and chlorinated solvents tetrachloroethene, trichloroethene, 1,1,1-trichloroethane, and trichlorofluoromethane), SVOCs, metals (including lead), and petroleum hydrocarbons (including gasoline, No. 1, 2, 4, 5, and 6 fuel oil).

The following pathways were identified for the site and discussed in greater detail in the site summary (Appendix B) and in the following sections:

- Complete pathways:
  - *Historical:* Groundwater, stormwater/wastewater direct discharge, overwater activities, discharge to sewer/CSO
- Potentially complete pathways:
  - *Current:* Stormwater/wastewater direct discharge
  - *Historical:* Overland transport

- Insufficient information to make a pathway determination:
  - *Current:* Groundwater, , overwater activities, discharge to sewer/CSO, overland transport, bank erosion, air
  - *Historical:* Bank erosion, air

Groundwater

Groundwater investigations have been conducted at the site since 1993. Groundwater contamination has been identified in several upland areas on the site (MEG 2004; USEPA 2004). Diesel fuel, No. 6 fuel oil, BTEX, and MTBE have been present in the groundwater at the site since at least 2003 (MEG 2004; USEPA 2004; EDR 2010). Groundwater at the site flows primarily in the direction of English Kills (MEG 2004). In 1997, oil was observed migrating through the bulkhead into English Kills (EDR 2010). A groundwater extraction and treatment remediation system was installed at the site in 1995 and was operational until 2004. Periodic groundwater sampling and analysis occurred between 1999 and 2004; however, these results were not included in records available for review (MEG 2004). Groundwater is a complete historical pathway. There is insufficient evidence to make a current pathway determination.

Overwater Activities

The site included two mooring areas for barge access. Historical overwater activities included the docking and loading and unloading of petroleum products and coal from barges (EDR 2010). Petroleum products were unloaded and transported to the upland portion of the site through conveyance piping that extended from the wharf to USTs located in the central portion of the site. Several documented spills to the waterway have occurred (EDR 2010). A 2010 aerial photograph shows a barge docked along the north shore of the site (Google Earth). Current use of the barge or association to the site is unknown. Overwater activities are a complete historical pathway. There is insufficient evidence to make a current pathway determination.

Stormwater/Wastewater Systems

Based on site topography, stormwater discharges from the eastern portion of the site are expected to flow overland to English Kills, infiltrate into the ground in the vegetated areas of the site, or drain to on-site infrastructure that discharges to English Kills. In 1965, NYSBOH

inspectors noted that the site's oil water separator was ineffective and that the site was discharging "oil wastes" to English Kills via two 3-inch diameter outfalls (NYSDOH 1965a, 1965b). Between 1987 and 1992, the site operated under a SPDES permit for discharge of effluent from the site's oil-water separator to the English Kills. The site had numerous permit-related compliance issues in the early 1990s, including failure to conduct the required discharge monitoring and as a result the permit holder(s) were fined (NYSDEC 2012a). Direct discharge of stormwater and wastewater is a complete historical pathway and a potentially complete current pathway.

A groundwater extraction and treatment remediation system was installed at the site in 1995 and was operational until 2004. The system included ten extraction wells outfitted with ejector pumps, an air compressor, OWS, and product storage tanks (MEG 2004). A GAC system was used to treat effluent before it discharged into the municipal sewer system. Effluent sampling was not conducted prior to discharge (USEPA 2004). The site is within the Newtown Creek WPCP sewershed. Stormwater and wastewater discharges from the western portion of the site flow into a combined municipal sewer system. When the combined flows exceed the system's capacity, untreated CSOs are discharged at Outfall NC-015, which discharges into the southeast end of English Kills, a tributary to Newtown Creek (NYCDEP 2007a). To the extent wastewater discharges from the site are coincident with CSO events, discharge to sewer/CSO is a complete historical pathway, and there is insufficient evidence to make a current pathway determination.

Overland Transport

Stormwater infrastructure was present on the western portion of the site as early as 1960 (NYSDOH 1960; NYSDEC 2012a). However, based on surface topography, runoff from the eastern portion of the site is expected to infiltrate into the ground or flow overland towards English Kills. The NYSDEC Spills Database also reported in March 1993 that approximately 200 gallons of waste oil spilled into English Kills due to a bulkhead collapse on the property adjacent to Morgan Oil (EDR 2010). Morgan Oil was contacted to clean up the spill but it was stated that no funds were available. It is not known if this spill could have impacted the Morgan Oil property. Overland transport is a potentially complete historical pathway. There is insufficient evidence to make a current pathway determination.

Bank Erosion

Historical files indicate that a timber bulkhead with solid fill existed on the west face of the property and the south side of the slip as early as 1953 (USACE 1953a). Historical industrial activities occurred near the bank and upland contamination has been identified on the site (MEG 2004; USEPA 2004). There is insufficient evidence to make an historical or current pathway determination.

Morgan Oil Terminal, Brooklyn – Data Gaps

A number of petroleum spills affecting surface water, soil, and groundwater occurred at the site. Upland site investigations have been conducted to characterize impacts to soil and groundwater, but reports were not included in files available for review. In 1997, oil was observed emanating from the bulkhead. Stormwater and wastewater containing COPCs was discharged from the site directly to English Kills and to the municipal system that overflows to English Kills. Impacts to creek sediment related to these historical discharges have not been evaluated.

The site is currently undergoing active remediation for potential future development. In 2010, the site owner (English Kills Ventures, LLC) was working to remove the remaining USTs and obtain demolition permits to remove remaining structures at the site. Following the demolition, the owner planned to conduct further subsurface testing beneath the USTs and structures and remedial activities necessary to redevelop the site (EDR 2010). The results of these investigations and current site activities are not known.

7.11 Bayside Fuel Oil Depot (DAR Site ID 51) – Summary

The site occupies approximately 1.5 acres adjacent to English Kills at creek mile 0.55. Since at least the 1910s, the site has been used for storage and distribution of coal and petroleum products, including No. 1, 2, 4, and 6 fuel oils, as well as diesel and kerosene (Bayside Fuel Oil Depot 2011). Potential areas of concern at the site include ASTs, USTs, spills, pipes, and ancillary equipment that transport and store petroleum products (including diesel, kerosene, and various fuel oils). COPCs for these sources include petroleum hydrocarbons, PAHs, VOCs, BTEX, SVOCs, and metals.

The following pathways were identified for the site and discussed in greater detail in the site summary (Appendix B) and in the following sections:

- Complete pathways:
  - *Historical:* Stormwater/wastewater direct discharge, groundwater, overwater activities
- Potentially complete pathways:
  - *Current:* Overwater activities, stormwater/wastewater direct discharge
  - *Historical:* Overland transport
- Insufficient information to make a pathway determination:
  - *Current:* Bank erosion, discharge to sewer/CSO, groundwater, overland transport, air
  - *Historical:* Bank erosion, discharge to sewer CSO, air

Overwater Activities

Petroleum products have been historically and are currently transferred from petroleum barges in English Kills to upland USTs and ASTs via pipeline (EDR 2010). In 1965, the site had a 124-foot timber bulkhead along its shoreline and one 8-inch and four 6-inch pipelines extending from the bulkhead to five USTs and one AST (total capacity of 39,300 barrels; USACE 1965). According to a 1998 survey, the site was being maintained for emergency receipt of petroleum products by barge (USACE 1999). The survey also noted that six 6-inch pipelines, not in use and sealed, extended from the wharf to 10 steel storage tanks (total capacity of 137,000 barrels). The tanks were also connected to an interstate pipeline (USACE 1999). In 1990, 5,000 gallons of No. 2 fuel oil were released to English Kills during barge offloading (NYSDEC Spill No. 9007551; NYSDEC 2012b; EDR 2010). This is a complete historical pathway and a potentially complete current pathway.

Stormwater/Wastewater Systems

In 1959, sanitary and process wastewater discharges from the site were routed through an OWS prior to discharge to the municipal system (Hazen and Sawyer 1959). In 1965, records indicate site that stormwater could either directly discharge to English Kills via discrete site

outfalls or over the bulkhead, or it could be collected by a separate stormwater piping system and discharge to English Kills (NYCDEP 2007c).

The site has been discharging treated stormwater and hydrostatic test water to English Kills since at least 1993 under a SPDES permit (Hazen and Sawyer 1959; NYSDEC 2011a). However, no historical or current permits were found in available site records and past DMRs have not been located.

This is a complete historical pathway and a potentially complete current pathway. There is insufficient evidence to make either a current or historical pathway determination for CSO/sewer discharges.

Overland Transport

No specific evidence of overland transport was found in available site records. In 1995, 10 gallons of No. 4 fuel oil was spilled at the site and impacted soil (NYSDEC 2012b). On-site stormwater infrastructure was not identified in files available for review. Based on the site topography, COPCs at the site could be carried in sheet flow overland towards English Kills. This is a potentially complete historical pathway. There is insufficient evidence to make a current pathway determination for overland transport.

Bank Erosion

Documentation from 1966, 1991, and 1998 indicates that portions of the site were bulkheaded with timber and concrete as described previously in this section (USACE 1965a, 1999; NYSDEC 2011a). There is insufficient evidence to make a historical or current pathway determination for bank erosion.

Groundwater

NAPL was observed in a monitoring well at the site after an unknown quantity of No. 2 fuel oil was spilled to groundwater (NYSDEC Spill No. 9007551; EDR 2010). No further information on groundwater investigations was located in files available for review. Thus, the historical pathway is complete, but there is insufficient evidence regarding the status of impacts to groundwater to make a current pathway determination.

Bayside Fuel Oil Depot, 1100 Grand St – Data Gaps

Little or no information on upland characterization or investigation was identified in documents available for review. Spills to surface soils and to the English Kills (from barge offloading to the site) occurred in the past on the site, and uplands subsurface contamination has been noted, as well. Stormwater is discharged directly to English Kills from the site and a SPDES permit exists, but no historical permits, DMRs, or stormwater infrastructure mapping was available for review. Impacts to creek sediment related to these historical discharges have not been evaluated.

Because the site is in close proximity to Newtown Creek and has a history of releases and discharges to the creek and uplands, as well as upland contamination and lack of upland characterization, further investigation is warranted to determine whether this is a source of significant COPCs to Newtown Creek.

8 HDR AREA DATA GAPS

8.1 Data Gaps

Information that will continue to be collected and assembled for relevance to the Study area includes:

Item	Data Gap
Historic Dredging (discussed in Section 4.1.1.2)	Information on maintenance dredging and other historical dredging (as available)
Upland Fill (discussed in Section 4.1.1.4)	information pertaining to upland fill sites adjacent to the creek
Bulkhead construction (discussed in Section 4.1.1.3)	Information pertaining to current bulkhead conditions to assess upland source pathways
Outfalls	Documentation regarding discharges and outfall connections from upland properties are necessary to complete evaluations of point source discharges to Newtown Creek.
Groundwater	An understanding of groundwater quality at upland properties and discharge potential to Newtown Creek
Data Gaps identified in Table 6-1	Information reviewed for DAR upland sites identified data gaps for upland sites that should assist in continued pathway evaluation

8.2 Additional Upland Source Sites

As described in Section 5, this DAR addressed the initial 91 sites selected for review. As shown in Section 4.2, there are numerous environmental sites within the HDR Area, all with the potential to contribute some load to Newtown Creek. The potential for these sites to contribute to the creek has not been evaluated, and the site summary process is still continuing within the HDR Area in order to identify sites that may have a potential significance to Newtown Creek.

8.3 Forthcoming Data

One objective of the HDR is to compile the relevant Study Area data that are available and use this information to aide in RI/FS evaluations and inform the CSM for the Study Area. As part of this effort, specific data sets were targeted for collection and these data were

described in Table 6-1 of the DCP. Information that was received through this process is included in the non-respondent site summaries but data gaps remain. Anchor QEA will continue to work with regulatory agencies and other sources of information to evaluate potential significant sources to the Study Area to these fill data gaps.

The City of New York is working with Anchor QEA to provide information related to municipal sewer infrastructure. Shoreline surveys will be reconciled to obtain an understanding of private outfalls to the system. This information will be used to assist in the evaluation of upland pipe transport pathways for sites not immediately adjacent to Newtown Creek as well as those adjacent. Further investigation, including identification of sites adjacent to the creek with overland transport pathways, sites that have connections to outfalls, and sites that have potentially significant groundwater contributions is needed to adequately evaluate stormwater and wastewater sources to Newtown Creek through future RI/FS evaluations and to further inform the CSM for the Study Area.

9 NEXT STEPS

As described in Section 2.3, the objective of the HDR was to use the extensive pre-existing relevant data for the Newtown Creek drainage area to support the RI/FS evaluations as these data will: 1) provide a robust basis of input for the development of the CSM; 2) provide an understanding of the current state of the Study Area; 3) aid in determining data gaps; and 4) aid in the evaluation of potential sources of significant contaminant loadings to the Study Area.

This DAR presents summaries of the physical and environmental datasets which have been gathered to date. As described above in Section 8.5 additional reports and data sets are still forthcoming as well as additional information needed to fill current data gaps in the physical and environmental data sets. This information will continue to be gathered and Anchor QEA will evaluate and use this information to revise site summaries, re-evaluate the significance of a potential loading source to the Study Area and identify additional upland sites to be evaluated.

This DAR summarized the 75 sites originally identified for evaluation, and Anchor QEA concluded that 11 sites were potentially significant sources to the Study Area while another 64 sites are sources of undetermined significance. As described in Section 8 above there are numerous data gaps to be filled for each individual site, which will allow a refinement of the source identification and significance process. The historical data review is ongoing and it is recognized that additional information and data are still available that may assist in the completion of the HDR goals and objectives, ultimately including the quantification of source loadings.

Using the information summarized to date in this DAR, the Interim Data Report will present recommendations for further data and information gathering, as well as suggested upland and in-creek investigations so that identified data gaps may be resolved. To the extent further collection of information and filling of data gaps requires assistance from USEPA and New York State Department of Environmental Conservation (NYSDEC) that shall be presented in the Interim Data Report as well.

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TABLES

Table 4-1
Dredging Table

Date	Location	Quantity of Material Removed (cubic yards)	Dredge Depth (feet)	Dredge Width (feet)	Dredge Length (feet)	Notes
1897	Newtown Creek: Vernon Avenue to Queens Oil Works	60,000	18	NR	NR	---
1915	Newtown Creek and English Kills: East River to Metropolitan Avenue	294,887	18	125	NR	---
1922	Newtown Creek: East River to Hobson Avenue	77,875	20	125 – 150	NR	---
1923	Dutch Kills: Main channel in Newtown Creek to the turning basin in Dutch Kills	207,407	20	75 – 200	2,800	The approximate quantity of material removed was calculated using a dredge width of 100 feet. The width of the dredged channel widened from 75 feet at the base of the turning basin to 200 feet at Newtown Creek. The dredge length was derived from activities proposed for the RHA of March 2, 1919 appropriations (USACE 1973).
1928	Newtown Creek: Western shore of the historic Brooklyn Union Gas Company site and a portion of Mussel Island	400,000	20	50	150	---
1929	Newtown Creek: Apollo Street to 100 feet west of the historic Meeker Avenue Bridge	5,400	NR	NR	NR	---
1929	Maspeth Creek and Newtown Creek: Lombardy Street to the historic National Enameling and Stamping Company	193,350	NR	Maspeth Creek: 100 Newtown Creek: 200	NR	---

Table 4-1
Dredging Table

Date	Location	Quantity of Material Removed (cubic yards)	Dredge Depth (feet)	Dredge Width (feet)	Dredge Length (feet)	Notes
1930	Maspeth Creek	NR	20	NR	NR	Dredging in progress during this time.
1932	Newtown Creek: 400 feet south of Greenpoint Avenue Bridge to 100 feet north of Meeker Avenue Bridge	146,000	23	70	NR	---
1933	Newtown Creek: East River to Mussel Island	NR	23	100	NR	Actual date dredged not reported; however, by this year the reported creek dimensions existed.
1936	Newtown Creek: Entire channel except span between Greenpoint Avenue Bridge and Meeker Avenue Bridge	NR	NR	130	NR	Actual date dredged not reported; however, by this year the reported creek dimensions existed.
06/1936	English Kills: Maspeth Avenue to Metropolitan Avenue Bridge	113,500	16	150	NR	---
1950	Newtown Creek: Entire channel except 105 feet between 500 feet upstream of the Greenpoint Avenue Bridge to Meeker Avenue	233,600	23	130	NR	---
Approximate Volume of Material Removed:		**1,515,757***				

Notes:
* – Value is an approximation based on available information.
--- – not applicable
NR – not reported
RHA – River and Harbor Act

Source:
USACE, 1973. *Maintenance Dredging of Newtown Creek, New York, Navigation Project. Final Environmental Statement* . Prepared by U.S. Army Engineer District New York, New York. February 7, 1973. [NEWT-0019395]

Table 4-2
Bridges on Newtown Creek

Bridge	Owner	Type	Use	Completed
Vernon Avenue (now Boulevard)	Removed			1860s
Pulaski Bridge	NYC	Bascule	Highway	09/1954
Long Island Rail Road Swing (Dutch Kills)	LIRR	Swing	Railroad	1861[1]
Long Island Rail Road Bascule (Dutch Kills)	LIRR	Bascule	Railroad	12/1921
Original Borden Avenue (Dutch Kills)	Replaced			1860s[1]
Borden Avenue (Dutch Kills)	NYC	Retractile	Highway	05/1908
Long Island Expressway (Dutch Kills)	NYC	Fixed	Highway	12/1940
Hunters Point Avenue (Dutch Kills)	NYC	Bascule	Highway	12/1910
Original Greenpoint Avenue	Replaced			1853 – 1854[1]
Greenpoint Avenue (JJ Byrne Memorial Bridge)	NYC	Bascule	Highway	12/1929
Penny Bridge (Meeker Avenue)	Removed			1812 – 1814[1]
Koscluszko Bridge	NYSDOT	Fixed	Highway	08/1939
Maspeth Plank Road Bridge	Removed			1846[1]
Grand Avenue Bridge (East Branch)	NYC	Swing	Highway	circa 1900
Grand Street/Metropolitan Avenue (English Kills)	NYC	Bascule	Highway	07/1933
Metropolitan Avenue (Williamsburg and Jamaica Turnpike)	Replaced			1814 – 1816[1]
LIRR Montrose Avenue (English Kills)	LIRR	Swing[2]	Railroad	03/1905

Notes:

1 – Bridges built and removed prior to U.S. Army Corps of Engineers permitting.

2 – This bridge is functionally a fixed bridge and serves as the head of navigation.

LIRR – Long Island Rail Road

NYC – New York City

NYSDOT – New York State Department of Transportation

Source:

NYSDOT and FHWA (New York State Department of Transportation and U.S. Department of Transportation Federal Highway Administration), 2005. *Newtown Creek Navigation Analysis* . Kosciuszko Bridge Project. September 22, 2005.

Table 4-3

SPDES and NPDES Sites within Newtown Creek HDR Area

Facility Name	Address	Program ID	Program
METRO TERMINALS CORP	498 KINGSLAND AVENUE	NY0007676	NPDES
CON EDISON - 11TH STREET	ASH AVENUE AND MCGUINESS BOULEVARD	NY0201138	NPDES
BFI WASTE SYSTEMS OF NEW JERSEY INC	72 SCOTT AVENUE	NYR00C271	NPDES
CHARLES J KING INC	1301 GRAND STREET	NYU700230	NPDES
BUCKEYE PIPE LINE CO - LONG ISLAND	2035 GREENPOINT AVENUE	NY0200441	NPDES
AMTRAK - NATIONAL RAILROAD PASSENGER CORP	52-31 2ND STREET	NY0267732	SPDES
PREMIUM PIPELINE INC	200 MORGAN AVENUE	NY0032824	SPDES
NEW YORK CITY DEPARTMENT OF SANITATION	48-01 58TH ROAD	NY0200841	SPDES
CONSOLIDATED EDISON COMPANY OF NEW YORK INC	11TH STREET BETWEEN 53RD AND ASH	NY0201138	SPDES
GETTY PETROLEUM MARKETING INC	30-23 GREENPOINT AVENUE	NY0028452	SPDES
BP PRODUCTS NORTH AMERICA INC	125 APOLLO STREET	NY0004596	SPDES
MALU PROPERTIES INC	364 MASPETH AVENUE	NY0005789	SPDES
MOTIVA ENTERPRISES LLC	25 PAIDGE AVENUE	NY0006131	SPDES
BAYSIDE FUEL OIL DEPOT CORP	1100 GRAND STREET	NY0007641	SPDES
METRO TERMINALS CORP	498 KINGSLAND AVENUE	NY0007676	SPDES
NYC DEPT OF ENVIRONMENTAL PROTECTION	329-69 GREENPOINT AVENUE	NY0276570	SPDES
EXXONMOBIL OIL CORP	400 KINGSLAND AVENUE	NY0267724	SPDES
NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION	329-69 GREENPOINT AVENUE	NY0026204	SPDES

Notes:

HDR – Historical Data Review

NPDES – National Pollutant Discharge Elimination System

SPDES – State Pollutant Discharge Elimination System

Table 5-1
Names of NYSDEC Sites, USEPA RCRA LQG Facilities, and
Other Historical Data Review Sites in Newtown Creek HDR Area

DCP Site Number	Site Name	Site Type
1	Atlas Park	USEPA RCRA LQG
2	Barker Bros - Ridgewood	USEPA RCRA LQG
3	Cleveland High School	USEPA RCRA LQG
4	Con Edison - Maspeth Substation	USEPA RCRA LQG
5	Con Edison - Newtown Substation	USEPA RCRA LQG
6	Confort & Company Inc	USEPA RCRA LQG
7	East New York Central Maintenance Facility (MTA-NYCT)	USEPA RCRA LQG
8	Enequist Chemical Co Inc	USEPA RCRA LQG
9	NYC Dept of Ed - Public School 480k	USEPA RCRA LQG
10	NYCDEP - Troutman St Venturi Flow Chamb	USEPA RCRA LQG
11	NYCDEP BWT - Newtown Creek WPCP	USEPA RCRA LQG
12	NYCDOT Bin 2240410	USEPA RCRA LQG
13	NYCT-Kisco Lot	USEPA RCRA LQG
14	Rhoda Uretsky Trust	USEPA RCRA LQG
15	TBTA Queens Midtown Tunnel	USEPA RCRA LQG
16	Phelps Dodge Corp	USEPA RCRA LQG
17	United Envelope	USEPA RCRA LQG
18	NYCT-Fresh Pond Depot	USEPA RCRA LQG
19	Remco Maintenance LLC	USEPA RCRA LQG
20	NYCT Crosstown Annex Facility	USEPA RCRA LQG
21	NYSDOT Bin 1075910	USEPA RCRA LQG
22	The Print House	USEPA RCRA LQG
23	192 Ralph Avenue	NYSDEC Site
24	2 Ingraham Street	NYSDEC Site
25	ACME Steel/Brass Foundry	NYSDEC Site
26	Atlantic Ave. and Utica Avenue	NYSDEC Site
27	B.C.F. Oil Refining, Inc.	NYSDEC Site
28	Cornish Knit Goods/Cornish Mini-Malls	NYSDEC Site
29	Former NuHart Plastic Manufacturing	NYSDEC Site
30	Former W.L.K. Corp.	NYSDEC Site
31	Frito Lay	NYSDEC Site
32	Greenpoint	NYSDEC Site
33	K - Equity Works	NYSDEC Site
34	K - Greenpoint MGP - Energy Center	NYSDEC Site
35	Maspeth Project	NYSDEC Site
36	Maspeth Substation	NYSDEC Site
37	Phelps Dodge Refining Corporation	NYSDEC Site
38	Popular Hand Laundry	NYSDEC Site
39	Quanta Resources	NYSDEC Site
40	Quanta Resources a/k/a Review Ave. Development II	NYSDEC Site
41	Review Avenue Development I	NYSDEC Site

Table 5-1
Names of NYSDEC Sites, USEPA RCRA LQG Facilities, and
Other Historical Data Review Sites in Newtown Creek HDR Area

DCP Site Number	Site Name	Site Type
42	Roehr Chemicals, Inc.	NYSDEC Site
43	Technical Metal Finishers	NYSDEC Site
44	B C F OIL - 360 Maspeth Ave	NYSDEC Site
45	Queens District 5/5a Garage	NYSDEC Site
46	Waste Management of NY-123 Varick Ave	NYSDEC Site
47	Getty Terminals Corp #58220	NYSDEC Site
48	BP Products N America Brooklyn Terminal	NYSDEC Site
49	Ditmas Terminal - 364 Maspeth Ave	NYSDEC Site
50	Motiva Enterprises LLC	NYSDEC Site
51	Bayside Fuel Oil Depot-1100 Grand St	NYSDEC Site
52	Metro Term-498 Kingsland Ave	NYSDEC Site
53	ExxonMobil Greenpoint Remediation Project	NYSDEC Site
54	NYC-DEP Newtown Creek WPCP	NYSDEC Site
55	BP Amoco Terminal Greenpoint	Other HDR Site
56	Former Pratt Oil Works	Other HDR Site
57	Mobil Oil	Other HDR Site
58	NYCON Supply Corp.	Other HDR Site
59	Empire Transit Mix Inc.	Other HDR Site
60	Former Morgan Oil	Other HDR Site
61	Former ExxonMobil Terminal	Other HDR Site
100	ACME Architectural Coatings, Inc./ACME Steel Partition (aka ACME Steel Door)	Other HDR Site
101	Klink Cosmo Cleaners	Other HDR Site
102	Amtrak Sunnyside Yard	Other HDR Site
103	Architectural Coatings, Inc.	Other HDR Site
104	Soap Manufacturer and Lacquer Storage	Other HDR Site
105	Berger Industries	Other HDR Site
106	Buckeye Pipeline Facility	Other HDR Site
107	Calleia Bros., Inc.	Other HDR Site
108	Chromium Plating and Polish	Other HDR Site
109	Compudyne, Inc.	Other HDR Site
110	Con Edison - 11th Street Conduit	Other HDR Site
111	353 McKibbin Street	Other HDR Site
112	Electronic Plating Corp.	Other HDR Site
113	Empire State Varnish Co., Inc.	Other HDR Site
114	Fast Processing, Inc.	Other HDR Site
115	Spic and Span Cleaners/Norman Cleaners and Dyers	Other HDR Site
122	Goodman Bros. Steel Drum	Other HDR Site
123	Gulf Oil Corporation - Greenpoint Bulk Plant	Other HDR Site
124	Hardchrome Electro Plating, Inc.	Other HDR Site
125	Hugo Neu Schnitzer (aka SIMS Hugo Neu)	Other HDR Site
126	Joseph H. Lowenstein & Sons, Inc. (aka Lowenstein Dyes & Cosmetics)	Other HDR Site

Table 5-1
Names of NYSDEC Sites, USEPA RCRA LQG Facilities, and
Other Historical Data Review Sites in Newtown Creek HDR Area

DCP Site Number	Site Name	Site Type
127	Kalex Chemical Products, Inc.	Other HDR Site
128	LIRR Long Island City Freight Yard (AOC 1)	Other HDR Site
129	LIRR Long Island City Freight Yard (AOC 2)	Other HDR Site
130	Manhattan Poly Bag	Other HDR Site
131	Levco Metals Property	Other HDR Site
132	Outlet City	Other HDR Site
133	Queens West (Hunter's Point) Center Boulevard	Other HDR Site
134	Pebble Lane Associates	Other HDR Site
135	101-105 West Street	Other HDR Site
136	Pinkas Fischer	Other HDR Site
137	PV Knit Goods Processing	Other HDR Site
138	Queens West (Hunter's Point) Parcel 11	Other HDR Site
139	Rencoa, Inc.	Other HDR Site
141	Silverman Gorf, Inc.	Other HDR Site
142	S&L Metal Products Corp.	Other HDR Site
143	STAR Corrugated Box Co.	Other HDR Site
144	Structural Processing Corp.	Other HDR Site
145	Town, County and State Recycling, Inc. (aka Review Avenue Recycling, Inc.)	Other HDR Site
146	Tru-Tone Metal Products	Other HDR Site
147	Ultramar Petroleum	Other HDR Site
149	Wilco Finishing Corp.	Other HDR Site
150	Wing Gong Laundry	Other HDR Site

Notes:
DCP – Data Collection Plan
HDR – Historical Data Review
LQG – large quantity generator
NYSDEC – New York State Department of Environmental Conservation
RCRA – Resource Conservation and Recovery Act
USEPA – U.S. Environmental Protection Agency

Table 5-2
DAR Site List

DAR Site ID Number	DAR Site Name	DCP Site Number[1]	Respondent Site
1	Atlas Park	1	
2	Barker Bros - Ridgewood	2	
3	Grover Cleveland High School	3	New York City
4	Con Edison - Maspeth Substation	4, 36	
5	Con Edison - Newtown Substation	5	
6	Confort & Company Inc.	6	
7	East New York Central Maintenance Facility (MTA-NYCT)	7	
8	Enequist Chemical Co. Inc.	8	
9	Bushwick Educational Campus	9	New York City
10	Troutman Street Venturi Flow Chamber	10	New York City
11a	Newtown Creek Wastewater Treatment Plant	11, 54	New York City
11b	Greenpoint Marine Transfer Station and Incinerator	11, 54	New York City
12	Borden Avenue Bridge	12	New York City
13	NYCT - Kisco Lot	13	
14	Rhoda Uretsky Trust	14	
15	TBTA Queens Midtown Tunnel	15	
16	Former Laurel Hill Site	16, 37	PDRC
17	United Envelope	17	
18	NYCT - Fresh Pond Depot	18	
19	Remco Maintenance LLC	19	
20	NYCT Crosstown Annex Facility	20	
21	NYSDOT BIN 1075910	21	
23	192 Ralph Avenue	23	
24	2 Ingraham Street	24	
25	ACME Steel/Brass Foundry	25	
26	Atlantic Ave. and Utica Avenue (Crown Heights)	26	
27	B.C.F. Oil Refining, Inc.	27, 44, 107	
28	Cornish Knit Goods/Cornish Mini-Malls	28	
29	Former NuHart Plastic Manufacturing	29	
30	Former W.L.K. Corp.	30	
31	Frito Lay	31	
32	Greenpoint Energy Center	32, 34	National Grid
33	Equity Works	33	National Grid
35	Maspeth Project	35	New York City
38	Popular Hand Laundry	38	
39	Quanta Resources a/k/a Review Ave. Development II	39, 40	
41	Review Avenue Development I	41	
42	Roehr Chemicals, Inc.	42	
43	Technical Metal Finishers	43	

Table 5-2
DAR Site List

DAR Site ID Number	DAR Site Name	DCP Site Number[1]	Respondent Site
45	Queens District 5/5a Garage	45	New York City
46	Waste Management of NY - 123 Varick Avenue	46	
47	Getty Terminals Corp. #58220	47	
48	BP Products N America Brooklyn Terminal	48, 55	BP
50	Motiva Brooklyn Terminal	50	
51	Bayside Fuel Oil Depot - 1100 Grand St	51	
52	Metro Terminal[2]	52	
53	ExxonMobil Greenpoint Remediation Project	53, 57, 61	ExxonMobil
56	Former Pratt Oil Works	56	ExxonMobil
58	NYCON Supply Corporation	58	
59	Empire Transit Mix, Inc.	59	
60	Morgan Oil Terminal, Brooklyn	60	
100	ACME Steel/Metal Works (aka ACME Architectural Products, Inc./ACME Steel Partition/ACME Steel Door)	100	
101	Former Klink Cosmo Cleaners	101	
102	Amtrak Sunnyside Yard	102	
103	Architectural Coatings, Inc.[3]	103	
104	Soap Manufacturer and Lacquer Storage	104	
105	Berger Industries	105	
106	Buckeye Pipeline Facility	106	
108	Chromium Plating and Polish	108	
109	Compudye, Inc.	109	
110	Con Edison - 11th Street Conduit	110	
111	353 McKibbin Street	111	
113	Empire State Varnish Co., Inc.	113	
114	Fast Processing, Inc.	114	
115	Former Spic and Span Cleaners and Dyers, Inc.	115	
122	Goodman Brothers Steel Drum	122	
123	Gulf Oil Corporation - Greenpoint Bulk Plant	123, 49	Texaco
124	Hardchrome Electro Plating, Inc.	124	
125	Hugo Neu Schnitzer (aka SIMS Hugo Neu)	125	
126	Joseph H. Lowenstein & Sons, Inc. (aka Lowenstein Dyes & Cosmetics)	126	
127	Kalex Chemical Products, Inc.	127	
128	LIRR Long Island City Freight Yard (AOC 1)	128	
129	LIRR Long Island City Freight Yard (AOC 2)	129	
130	Manhattan Poly Bag	130	
131	Levco Metals Property	131	
132	Outlet City	132	
133	Queens West (Hunter's Point) Center Boulevard	133	

Table 5-2
DAR Site List

DAR Site ID Number	DAR Site Name	DCP Site Number[1]	Respondent Site
134	Pebble Lane Associates	134	
135	101-105 West Street	135	
136	Pinkas Fischer	136	
137	PV Knit Goods Processing	137	
138	Queens West (Hunter's Point) Parcel 11	138	
139	Rencoa, Inc.	139	
141	Silverman Gorf, Inc.	141	
142	S&L Metal Products Corp.[4]	142	
143	STAR Corrugated Box Co.	143	
144	Structural Processing Corp.	144	
145	Town, County and State Recycling, Inc. (aka Review Avenue Recycling, Inc.)[5]	145	
146	Tru-Tone Metal Products	146	
149	Wilco Finishing Corp.	149	
150	Wing Gong Laundry	150	
200	Former Paragon Oil Terminal	NA	Texaco

Notes:
1 – Multiple DCP numbers indicate former individual sites were combined into a single DAR site following discussion at the November 17, 2011 meeting.
2 – DAR Site ID #147, Ultramar Petroleum, was combined into DAR Site ID #52, Metro Terminal, because they are located at the same address.
3 – DAR Site ID #22, The Print House, was combined into DAR Site ID #103, Architectural Coatings, Inc., because they are located at the same address.
4 – DAR Site ID #112, Electronic Plating Corp., was combined into DAR Site ID #142, S&L Metal Products Corp., because they are located at the same address.
5 – DAR Site ID #145 is located at the Former Pratt Oil Works, DAR Site ID #56.
BP – BP Products North America, Inc.
DAR – Data Applicability Report
DCP – Data Collection Plan
PDRC – Phelps Dodge Refining Corporation

Table 5-3
Source Table
(Pathway Status Designation, Notes, and COPC Acronyms)

Pathway Status Designations

Category a: A complete pathway. Exists when specific evidence is present for a transport mechanism to the creek and specific evidence indicates COPCs are in relevant media.

Category b: A potentially complete pathway. Exists when reasonable lines of evidence are present for a transport mechanism and reasonable lines of evidence indicate COPCs are in relevant media that together can form a reasonable weight of evidence approach using professional judgment.

Category c: Insufficient evidence to make a pathway determination. Exists when no specific evidence is present for a transport mechanism or no specific evidence indicates COPCs are in relevant media. This pathway designation can occur when information is missing or lacking to draw a firmer conclusion.

Category d: Pathway is not complete. Exists when specific evidence indicates that there is no transport mechanism from the site to Newtown Creek or the pathway is simply not present (e.g., bank erosion at an inland site not on the creek).

Notes

Potential COPC(s) – A chemical that could be present at the site, as determined by historical and current site use and operations.

Documented COPC(s) – A chemical historically or currently present at the site, as detected in sampled media, identified as having been released to site media or documented to have been released directly to the creek from site operations.

Evidence – Actual documentation/observations (e.g., analytical data, lab reports, noncompliance listings, notices of violations (NOVs), spill reports, etc.).

NAPL – nonaqueous phase liquid (Y: site investigations found NAPL presence; N: site investigations did not find NAPL presence; and ?: unknown, typically due to lack of sampling information)

C – current pathway

H – historical pathway

NA – not available in site records available for review

Constituent of Potential Concern (COPC) Acronyms

BTEX – petroleum-related (i.e., benzene, toluene, ethylbenzene, and xylenes)

CVOC – chlorinated volatile organic compound

DF – dioxin/furan

HP – herbicide and pesticide

M – metal

MTBE – methyl tertiary-butyl ether

PAH – polycyclic aromatic hydrocarbon

PCB – polychlorinated biphenyl

PHN – phenolic

SVOC – semi-volatile organic compound

TPH – total petroleum hydrocarbon (could include, but is not limited to, gasoline-range organics [GRO], diesel-range organics [DRO], heavy-range organics [MRO], waste oil, and fuel oils)

VOC – volatile organic compound

Table 5-3
Source Table

Site Name	DAR No.	Creek Mile	Borough	Adjacent to Creek	Distance to Creek	Respon-dent Site	Historical site use (i.e., industries)	Current site use (i.e., industry)	Historical Potential Areas of Concern (i.e., sources)	Current Potential Areas of Concern (i.e., sources)	Potential COPCs	Pathway Summary											
												Groundwater			Direct Discharge				Discharge to Sewer/CSO		Overland Transport		Bank Erosion	
															Stormwater/ Wastewater		Overwater							
												Documented COPCs	Pathway Status	NAPL	Documented COPCs	Pathway Status	Documented COPCs	Pathway Status	Documented COPCs	Pathway Status	Documented COPCs	Pathway Status	Documented COPCs	Pathway Status
101-105 West Street	135	NA	Brooklyn	No	0.30 mile	No	Lumber storage yard; warehouse/garage and paper storage	Construction materials and equipment storage	Two diesel ASTs; lumber storage area; two hot spots (based on investigations)	Construction materials and equipment storage areas	TPH, BTEX, CVOC, VOC, SVOC, PAH, M	VOC, M	H-d, C-d	?	NA	H-d, C-d	NA	H-d, C-d	NA	H-d, C-d	NA	H-d, C-d	NA	H-d, C-d
192 Ralph Avenue	23	NA	Brooklyn	No	1.80 miles	No	Dry cleaner	Commercial rental (unoccupied)	Former dry cleaning operations	Residual contamination following remedial activities (SVE system in-place and on-site/off-site groundwater)	VOC, CVOC	CVOC	H-c, C-c	N	NA	H-c, C-c	NA	H-d, C-d	NA	H-c, C-c	NA	H-d, C-d	NA	H-d, C-d
2 Ingraham Street	24	NA	Brooklyn	No	0.14 mile	No	Church, orphanage, parochial school, umbrella manufacturer, metal finishing, and zipper manufacturer	Vacant building	A spill, ASTs, floor trench, unlabeled drums, and other equipment, products, and activities associated to site operations (including an umbrella manufacturer, zipper manufacturer, and metal plating and finishing)	NA	TPH, VOC, CVOC, M, PAH, SVOC, PHN	CVOC, M	H-b, C-c	N	NA	H-c, C-c	NA	H-d, C-d	NA	H-a, C-c	NA	H-d, C-d	NA	H-d, C-d
353 McKibbin Street	111	NA	Brooklyn	No	0.21 mile	No	Chemical manufacturer; lacquer spraying facility; paper box storage	Vacant lot	Equipment and products used in chemical manufacturing and lacquer spraying practices and operations; drum disposal area	NA	VOC, CVOCs, SVOC, PAH, M, HP	VOC, M, HP	H-b, C-b	Y	NA	H-c, C-c	NA	H-d, C-d	NA	H-c, C-c	NA	H-d, C-d	NA	H-d, C-d
ACME Steel/Brass Foundry	25	2.3	Brooklyn	No	0.30 mile	No	Brass, bronze, and aluminum castings and manufacturer of painted metal products	Marble and granite distribution warehouse	UST, waste storage, chemical storage, chemical bath/paint booth, and floor drains	NA	VOC, CVOC, TPH	VOC, CVOC	H-c, C-b	?	NA	H-c, C-c	NA	H-d, C-d	NA	H-c, C-c	NA	H-d, C-d	NA	H-d, C-d
ACME Steel/Metal Works	100	2.3	Brooklyn	No	0.35 mile	No	Fabricated structural steel, miscellaneous ornamental ironworks, manufacture steel doors/frames, and steel/glass partitions	Vacant building	Iron and structural steel manufacturing, regulated waste transfer between ACME locations, chemical storage, paint booths, drying oven, chemical phosphating/metal pretreatment operations, wastewater ASTs, degreasing dip tanks and operations, historical and unknown USTs, process area floor drains with unknown outfall, and petroleum impacted soil	NA	BTEX, TPH, VOC, CVOC, M	VOC, CVOC	H-c, C-b	?	NA	H-a, C-a	NA	H-d, C-d	M, VOC	H-a, C-a	NA	H-d, C-d	NA	H-d, C-d
Amtrak Sunnyside Yard	102	NA	Queens	No	0.17 mile	No	Classification, cleaning, and storage of passenger railroad cars	Railroad storage and maintenance facility	Railroad car maintenance, cleaning, and storage areas; gasoline and No. 2 fuel oil ASTs/USTs; fueling operations; drum storage; and material receiving area	Locomotive and rail car maintenance and repair; railroad car washer; transformers; diesel, waste oil, and kerosene ASTs/USTs	TPH, BTEX, VOC, CVOC, SVOC, PAH, M, PCB	CVOC, BTEX, M	H-a, C-a	Y	NA	H-b, C-c	NA	H-d, C-d	VOC, SVOC, M, PCB	H-a, C-b	TPH, PCB	H-a, C-d	NA	H-d, C-d

Table 5-3
Source Table

Site Name	DAR No.	Creek Mile	Borough	Adjacent to Creek	Distance to Creek	Respon-dent Site	Historical site use (i.e., industries)	Current site use (i.e., industry)	Historical Potential Areas of Concern (i.e., sources)	Current Potential Areas of Concern (i.e., sources)	Potential COPCs	Pathway Summary												
												Groundwater			Direct Discharge				Discharge to Sewer/CSO		Overland Transport		Bank Erosion	
												Documented COPCs	Pathway Status	NAPL	Stormwater/ Wastewater		Overwater		Documented COPCs	Pathway Status	Documented COPCs	Pathway Status	Documented COPCs	Pathway Status
															Documented COPCs	Pathway Status	Documented COPCs	Pathway Status						
Architectural Coatings, Inc.	103	NA	Brooklyn	No	0.25 mile	No	Steel-spring mattress manufacturer, doll manufacturer, and coated aluminum manufacturer (including electroplating)	Printing and binding	Equipment and products used in steel-spring mattress and doll manufacturing practices and operations, electroplating and coated aluminum manufacturing practices and operations (including aluminum cleaning, etching, phosphating, and powder coating), and an AST	Equipment and products used in printing and binding practices and operations and an AST	CVOC, SVOC, VOC, M, TPH	NA	H-c, C-c	?	NA	H-c, C-c	NA	H-d, C-d	NA	H-b, C-c	NA	H-d, C-d	NA	H-d, C-d
Atlantic Ave. and Utica Avenue (Crown Heights)	26	NA	Brooklyn	No	2.17 miles	No	Gas station	Auto retail store (Autozone)	On-site USTs and associated underground piping	Residual contamination following remedial activities (deed restriction in-place for groundwater)	TPH, BTEX, VOC, SVOC, PAH	BTEX, VOC, SVOC	H-c, C-c	N	NA	H-c, C-c	NA	H-d, C-d	NA	H-c, C-c	NA	H-d, C-d	NA	H-d, C-d
Atlas Park	1	NA	Queens	No	2.70 miles	No	Manufacturing and processing companies including millworks, cable manufacturing, textile processing, paint and dye manufacturing, laundry, gunpowder and explosives, garage truck storage and maintenance, and various distribution companies	Buildings, parking areas, and landscaping, which supports shops, restaurants, a movie theater, and distribution warehouses	Products and equipment used during historical operations (including conveyance piping, USTs, ASTs, electrical transformers, and a boiler room), historical waste generation, and historical fill and spills	Equipment and products used during current site practices and operations (including waste generation)	TPH, BTEX, VOC, CVOC, SVOC, PAH, M, PCB	TPH, CVOC	H-c, C-c	N	NA	H-c, C-c	NA	H-d, C-d	NA	H-c, C-c	NA	H-d, C-d	NA	H-d, C-d
B.C.F. Oil Refining, Inc.	27	0.2 (English Kills)	Brooklyn	Yes	Adjacent	No	Petroleum distribution center and waste oil processing facility	Automobile impound lot	Products and equipment used in petroleum distribution and waste oil processing practices and operations (including processing areas, unloading/loading areas and associated piping, a dock/distribution terminal, and an oil/water separator system), ASTs, USTs, and spills	Products and equipment used in automobile impound practices and operations	PCB, PAH, VOC, SVOC, CVOC, TPH, M	PCB, VOC, PAH, M, TPH	H-a, C-b	Y	NA	H-a, C-b	TPH, PCB	H-a, C-c	NA	H-b, C-b	VOC, TPH	H-b, C-c	NA	H-c, C-c
Barker Bros - Ridgewood	2	NA	Queens	No	1.70 miles	No	NA	Developer and manufacturer of buffs and buffing treatments	Gasoline USTs	Products and equipment used in the development and manufacturing of buffs and buffing treatments; fuel oil AST	TPH, VOC, CVOC, PAH	NA	H-c, C-c	?	NA	H-c, C-c	NA	H-d, C-d	NA	H-c, C-c	NA	H-d, C-d	NA	H-d, C-d

Table 5-3
Source Table

Site Name	DAR No.	Creek Mile	Borough	Adjacent to Creek	Distance to Creek	Respon-dent Site	Historical site use (i.e., industries)	Current site use (i.e., industry)	Historical Potential Areas of Concern (i.e., sources)	Current Potential Areas of Concern (i.e., sources)	Potential COPCs	Pathway Summary												
												Groundwater			Direct Discharge				Discharge to Sewer/CSO		Overland Transport		Bank Erosion	
												Documented COPCs	Pathway Status	NAPL	Stormwater/ Wastewater		Overwater		Documented COPCs	Pathway Status	Documented COPCs	Pathway Status	Documented COPCs	Pathway Status
															Documented COPCs	Pathway Status	Documented COPCs	Pathway Status						
Bayside Fuel Oil Depot - 1100 Grand St	51	0.55 (English Kills)	Brooklyn	Yes	Adjacent	No	Ice block generator, coal storage, and petroleum storage	Wholesale and retail distribution of petroleum products	Equipment and products used and activities performed during ice block generation, coal and petroleum storage and distribution practices and operations (including ASTs, USTs, and associated conveyance piping; ancillary equipment that transports and stores petroleum products; and site discharges), and spills	Equipment and products used and activities performed during petroleum storage and distribution practices and operations (including ASTs, USTs, and associated conveyance piping; ancillary equipment that transports and stores petroleum products; and site discharges)	TPH, PAH, VOC, SVOC, M	TPH	H-a, C-c	Y	TPH	H-a, C-b	TPH	H-a, C-b	NA	H-c, C-c	TPH	H-b, C-c	NA	H-c, C-c
Berger Industries	105	NA	Queens	No	1.81 miles	No	Manufacturer of radio and radio parts, electric welded steel tubing, threaded pipe, lamp parts, electrical fittings, and zinc electroplating	Veterinary clinic and lead paint, asbestos, and mold remediation business	Fuel oil ASTs (2); manufactured radio and radio parts; manufactured electric welded steel tubing, threaded pipe, lamp parts, electrical fittings, zinc electroplating	NA	TPH, VOC, CVOC, SVOC, M	NA	H-c, C-c	?	NA	H-c, C-c	NA	H-d, C-d	CVOC, M	H-c, C-c	NA	H-d, C-d	NA	H-d, C-d
Borden Avenue Bridge	12	NA	Queens	Yes	Adjacent	Yes	Bridge and operator house	Bridge and operator house	Spill	NA	M, PAH, HP, PCB, TPH, VOC, SVOC	M	H-d, C-d	N	NA	H-c, C-c	NA	H-d, C-d	NA	H-c, C-c	NA	H-c, C-c	NA	H-c, C-c
BP Products N America Brooklyn Terminal	48	1.6	Brooklyn	Yes	Adjacent	Yes	Petroleum refining/bulk storage terminal	Petroleum bulk storage terminal	Spills, bulk terminal and distribution operation areas, petroleum conveyance pipelines, petroleum ASTs and USTs, and refining operation areas	Bulk terminal and distribution operation areas, current NAPL plume from historical refinery operations, 2,000-gallon UST, and spills	TPH, VOC, BTEX, PAH, SVOC, MTBE	VOC, SVOC, MTBE, BTEX	H-b, C-d	Y	NA	H-c, C-c	NA	H-c, C-d	BTEX, TPH	H-c, C-c	NA	H-c, C-c	NA	H-c, C-c
Buckeye Pipeline Facility	106	NTC 1.15 – 1.2	Queens	Yes	Adjacent	No	Portion of Greenpoint Avenue rail yard	Petroleum pipeline facility	Railroad cars and tracks and historical spills	Tanks, pipelines, and ancillary equipment that transport and store petroleum products (including gasoline, fuel oil, and hydraulic oil), transformer, and batteries	TPH, BTEX, VOC, SVOC, PAH, PCB, M	VOC, BTEX	H-a, C-b	Y	BTEX	H-a, C-b	NA	H-c, C-c	NA	H-c, C-c	TPH, MTBE	H-b, C-b	NA	H-b, C-c
Bushwick Educational Campus	9	NA	Brooklyn	No	1.24 miles	Yes	School	School	NA	NA	NA	NA	H-d, C-d	?	NA	H-d, C-d	NA	H-d, C-d	NA	H-d, C-d	NA	H-d, C-d	NA	H-d, C-d
Chromium Plating and Polish	108	NA	Brooklyn	No	1.51 miles	No	Nickel and chromium plating, polishing, and coating	Vacant lot	Tanks and processing equipment for plating operations; fuel tanks	NA	TPH, BTEX, VOC, CVOC, SVOC, PAH, M	NA	H-d, C-d	N	NA	H-d, C-d	NA	H-d, C-d	NA	H-d, C-d	NA	H-d, C-d	NA	H-d, C-d

Table 5-3
Source Table

Site Name	DAR No.	Creek Mile	Borough	Adjacent to Creek	Distance to Creek	Respon-dent Site	Historical site use (i.e., industries)	Current site use (i.e., industry)	Historical Potential Areas of Concern (i.e., sources)	Current Potential Areas of Concern (i.e., sources)	Potential COPCs	Pathway Summary											
												Groundwater			Direct Discharge				Discharge to Sewer/CSO		Overland Transport		Bank Erosion	
															Stormwater/ Wastewater		Overwater							
												Documented COPCs	Pathway Status	NAPL	Documented COPCs	Pathway Status	Documented COPCs	Pathway Status	Documented COPCs	Pathway Status	Documented COPCs	Pathway Status	Documented COPCs	Pathway Status
Compudye, Inc.	109	NA	Queens	No	0.37 mile	No	Alcohol warehouse; textile dyeing	Textile dyeing	Textile dyeing machines	Fabric washing/drying and textile dyeing equipment; No. 2 fuel oil AST	TPH, VOC, CVOC, BTEX, SVOC, M	NA	H-c, C-c	?	NA	H-c, C-c	NA	H-d, C-d	NA	H-a, C-b	NA	H-d, C-d	NA	H-d, C-d
Con Edison - 11th Street Conduit	110	0.6	Brooklyn	Yes	Adjacent	No	Coal yards and conduit outfall	Electric power distribution	Spills and leaks from electrical equipment in conduit	Spills and leaks from electrical equipment in conduit	PCB, VOC	NA	H-c, C-c	?	NA	H-b, C-a	NA	H-c, C-c	NA	H-c, C-c	NA	H-c, C-c	NA	H-c, C-c
Con Edison - Maspeth Substation	4	NA	Queens	No	0.43 mile	No	Electrical substation; tire-recapping	Textile storage	Transformers and electrical equipment; used oil AST	NA	TPH, PCB, VOC, BTEX, SVOC, M	PCB, VOC, M	H-a, C-a	Y	NA	H-c, C-c	NA	H-d, C-d	NA	H-c, C-b	NA	H-d, C-d	NA	H-d, C-d
Con Edison - Newtown Substation	5	NA	Queens	No	0.35 mile	No	Truck storage	Electrical substation	Truck parking; ASTs	Transformers and electrical equipment	VOC, BTEX	NA	H-c, C-c	N	NA	H-c, C-c	NA	H-d, C-d	NA	H-c, C-c	NA	H-d, C-d	NA	H-d, C-d
Confort & Company Inc.	6	NA	Queens	No	0.08 mile	No	Furniture and bed springs manufacturer	Printing services	Equipment and processes for bed springs and furniture manufacturing; Fuel oil AST	Printing processes and equipment; fuel oil AST	BTEX, VOC, CVOC, PAH, PCB, M	NA	H-c, C-c	?	NA	H-c, C-c	NA	H-d, C-d	NA	H-c, C-c	NA	H-d, C-d	NA	H-d, C-d
Cornish Knit Goods/Cornish Mini-Malls	28	NA	Brooklyn	No	0.08 mile	No	Textile manufacturer, children outerwear manufacturer, illegal dry cleaner, and stolen car scrap yard	Shelter and rehabilitation center for the homeless	Products and equipment used and activities performed during former site operations (including textile manufacturing, children outerwear manufacturing, illegal dry cleaning, vehicle scrap yard operations, and hazardous waste accumulation areas), USTs, and spills	NA	CVOC, VOC, SVOC, M, TPH	VOC, SVOC, M, CVOC	H-a, C-c	N	NA	H-c, C-c	NA	H-d, C-d	NA	H-c, C-c	NA	H-d, C-d	NA	H-d, C-d
East New York Central Maintenance Facility (MTA-NYCT)	7	NA	Brooklyn	No	2.45 miles	No	Storage yard and repair shops for train cars	Active MTA-NYCT maintenance and repair facility	Products and equipment used in railway maintenance and repair practices and operations, including ASTs and USTs and associated conveyance piping, and spills	Products and equipment used in railway maintenance and repair practices and operations, including ASTs	TPH	NA	H-c, C-c	?	NA	H-c, C-c	NA	H-d, C-d	NA	H-c, C-c	NA	H-d, C-d	NA	H-d, C-d
Empire State Varnish Co., Inc.	113	NA	Brooklyn	No	0.10 mile	No	Manufacturer of paints, varnishes, epoxies, and resin solutions	Site purchased to expand existing subsurface oil product recovery system in 2008	Production areas and equipment; storage sheds; resin and varnish ASTs; mineral spirit USTs	NA	VOC, BTEX, CVOC, SVOC, PAH, PCB, M	VOC, CVOC, SVOC, M	H-a, C-b	Y	NA	H-c, C-c	NA	H-d, C-d	NA	H-c, C-b	NA	H-d, C-d	NA	H-d, C-d
Empire Transit Mix, Inc.	59	2.8	Brooklyn	Yes	Adjacent	No	Lumber year, coal storage, and trucking company	Ready mix concrete	Areas used for sorting lumber and coal, vehicle fueling and maintenance, concrete mixing, and USTs and historical tank failure	On-site LNAPL, aggregate piles, concrete mixing, and illicit discharges to waterway	TPH, VOC, SVOC, BTEX, PAH, M	TPH, BTEX, M	H-a, C-b	Y	NA	H-a, C-b	NA	H-b, C-b	NA	H-b, C-b	NA	H-b, C-b	NA	H-c, C-c

Table 5-3
Source Table

Site Name	DAR No.	Creek Mile	Borough	Adjacent to Creek	Distance to Creek	Respon-dent Site	Historical site use (i.e., industries)	Current site use (i.e., industry)	Historical Potential Areas of Concern (i.e., sources)	Current Potential Areas of Concern (i.e., sources)	Potential COPCs	Pathway Summary												
												Groundwater			Direct Discharge				Discharge to Sewer/CSO		Overland Transport		Bank Erosion	
												Documented COPCs	Pathway Status	NAPL	Stormwater/ Wastewater		Overwater		Documented COPCs	Pathway Status	Documented COPCs	Pathway Status	Documented COPCs	Pathway Status
															Documented COPCs	Pathway Status	Documented COPCs	Pathway Status						
Enequist Chemical Co. Inc.	8	NA	Queens	No	0.14 mile	No	Industrial chemical distributor	Food service distributor	Equipment and products used in industrial chemical distribution (including outdoor chemical storage and handling areas, loading and unloading areas, ASTs and USTs used to store and blend chemicals) and spills	NA	VOC, M, TPH	TPH, VOC	H-c, C-c	?	NA	H-c, C-c	NA	H-d, C-d	NA	H-c, C-c	NA	H-d, C-d	NA	H-d, C-d
Equity Works	33	0.5	Brooklyn	No	0.13 mile	Yes	Manufactured gas plant and solid waste/construction debris transfer station	Construction and demolition processing; vehicle and equipment storage	Former gas storage relief holder, storage areas, purifier house, tar and gas storage tanks, tar wells, separators and drip tank areas, and spills	Leaks and spills from equipment and maintenance areas	VOC, BTEX, PAH, SVOC, M, PCB, TPH	VOC, SVOC, M, PCB	H-c, C-c	Y	NA	H-c, C-d	NA	H-c, C-d	NA	H-c, C-d	NA	H-c, C-d	NA	H-c, C-d
ExxonMobil Greenpoint Remediation Project	53	1.1	Brooklyn	Yes	Adjacent	Yes	Petroleum refining, storage and distribution	Parking	Spills, areas associated to a petroleum refinery and bulk storage terminal, and historical fill	NA	TPH, BTEX, VOC, CVOC, SVOC, PAH, PHN, PHT, M, PCB, HP	TPH, VOC, SVOC, MTBE, BTEX, M	H-a, C-d	Y	VOC	H-a, C-d	NA	H-d, C-d	VOC	H-c, C-c	NA	H-d, C-d	NA	H-d, C-d
Fast Processing, Inc.	114	NA	Brooklyn	No	1.86 miles	No	Yarn dyeing and textile dyer	NA	Wastewater discharges and linen and wool dyeing processing areas	NA	CVOC, BTEX	NA	H-c, C-c	?	NA	H-c, C-c	NA	H-d, C-d	NA	H-a, C-c	NA	H-d, C-d	NA	H-d, C-d
Former Gulf Oil Corporation - Greenpoint Bulk Plant	123	0.1 (English Kills)	Brooklyn	Yes	Adjacent	Yes	Animal rendering and bone boiling, glue manufacturing, and bulk fuel storage facility	Automobile impound lot	Products and equipment used in animal rendering and bone boiling, glue manufacturing, and oil storage and distribution (including storage areas, conveyance piping, loading racks, and ancillary equipment), ASTs and USTs, and spills	Equipment and automotive repair shops, and 2,000-gallon UST	TPH, VOC, BTEX, SVOC, PAH, BTEX	MTBE, TPH, BTEX, VOC, SVOC	H-c, C-b	Y	NA	H-c, C-c	NA	H-c, C-d	TPH	H-c, C-c	TPH	H-c, C-c	NA	H-c, C-c
Former Klink Cosmo Cleaners	101	NA	Brooklyn	No	0.40 mile	No	Industrial dry cleaner	NA	Equipment, products, and wastes associated with industrial dry-cleaning practices and operations	NA	VOC, CVOC, SVOC	CVOC	H-a, C-a	?	NA	H-d, C-d	NA	H-d, C-d	NA	H-d, C-d	NA	H-d, C-d	NA	H-d, C-d
Former Laurel Hill Site	16	NTC 2.1 – 2.4 Maspeth 0 – 0.1	Queens	Yes	Adjacent	Yes	Copper smelting and refining; repackaging and distribution of bulk acids; copper sulfate plant; and equipment/truck storage	Restaurant supply storage/distribution facility; trucking storage/transfer yard; car/limousine facility; and lumber storage	Processing areas and equipment used in smelting operations (including electrical transformers, smokestacks, electrolytic tank house areas, furnace areas, and fill, drainage, and sludge lagoon areas); truck storage areas; gasoline and diesel USTs; No. 5 fuel oil and motor oil ASTs; sulfuric acid, ammonia, and nitric acid ASTs; and spills	Truck storage areas; lumber yard; and No. 4 fuel oil AST	TPH, BTEX, VOC, SVOC, M, PCB, PAH, MTBE	TPH, M, VOC, SVOC, PCB, BTEX, MTBE	H-b, C-d	Y	NA	H-b, C-d	M	H-b, C-d	NA	H-b, C-d	NA	H-b, C-d	NA	H-c, C-d

Table 5-3
Source Table

Site Name	DAR No.	Creek Mile	Borough	Adjacent to Creek	Distance to Creek	Respon-dent Site	Historical site use (i.e., industries)	Current site use (i.e., industry)	Historical Potential Areas of Concern (i.e., sources)	Current Potential Areas of Concern (i.e., sources)	Potential COPCs	Pathway Summary											
												Groundwater			Direct Discharge				Discharge to Sewer/CSO		Overland Transport		Bank Erosion	
															Stormwater/ Wastewater		Overwater							
												Documented COPCs	Pathway Status	NAPL	Documented COPCs	Pathway Status	Documented COPCs	Pathway Status	Documented COPCs	Pathway Status	Documented COPCs	Pathway Status	Documented COPCs	Pathway Status
Former NuHart Plastic Manufacturing	29	0.2	Brooklyn	No	0.09 mile	No	Piano plate factory, Silexo soap manufacturer, boiler shop, warehouse, and plastics factory	Plastic and resin manufacturer	Former USTs and historical site operations	Sub-grade pipe trenches, oil-water separator, drum storage area, loading dock drain, printing press pits, silos, oil stained walls, and freight elevator	TPH, BTEX, VOC, SVOC, PHT	TPH, PHT, VOC, SVOC, BTEX, PAH	H-a, C-a	Y	NA	H-c, C-c	NA	H-d, C-d	NA	H-c, C-c	NA	H-d, C-d	NA	H-d, C-d
Former Paragon Oil Terminal	200	1.8	Brooklyn	Yes	Adjacent	Yes	Petroleum terminal	Warehouse with operating wine and spirit distribution business	Truck loading rack areas, USTs and ASTs, transfer pipes and pumps, motor oil canning house, and boiler room	NAPL seep in bulkhead, truck loading bays	TPH, VOC, BTEX, CVOC, PAH, SVOC, M	SVOC, VOC, M, BTEX	H-a, C-d	Y	NA	H-c, C-b	NA	H-c, C-d	VOC, M	H-b, C-d	NA	H-c, C-d	NA	H-c, C-d
Former Pratt Oil Works	56	1.6 – 1.9	Queens	Yes	Adjacent	Yes	Kerosene lamp company, asphalt mining and kerosene gas factory, paraffin wax refinery, and petroleum and chemical operations	Solid waste transfer station, recycling, warehouse for steel company, vehicle storage for towing company, valve manufacturer, wholesale building materials, refrigeration supply distributor, cleaning products manufacturer, and retail lumber	On-site NAPL plume, soil contamination	On-site NAPL plume, soil contamination	CVOC, SVOC, PAH, VOC, M, TPH, MTBE	VOC, MTBE, SVOC, M, TPH	H-a, C-b	Y	NA	H-b, C-b	NA	H-b, C-d	NA	H-c, C-c	NA	H-b, C-b	NA	H-c, C-c
Former Spic and Span Cleaners and Dyers, Inc.	115	NA	Brooklyn	No	0.27 mile	No	Silk dyeing and finishing; industrial dry cleaning	Residential; warehouse; woodworking	Equipment and products associated with industrial dry-cleaning and silk dyeing practices and operations	Woodworking equipment	CVOC, VOC	CVOC	H-a, C-b	Y	NA	H-d, C-d	NA	H-d, C-d	NA	H-d, C-d	NA	H-d, C-d	NA	H-d, C-d
Former W.L.K. Corp.	30	NA	Queens	No	0.37 mile	No	Lubricating oils and grease operations, radiator distribution facility, beer distribution, recycling facility, filling station, and tubular steel products manufacturing	Distributor of lumber and building materials	Lubricating oils and grease operations, recycling storage, gas station, and heating oil and gasoline USTs	Lumber yard; diesel AST	TPH, BTEX, VOC, SVOC, CVOC, M, PAH	CVOC, BTEX	H-b, C-b	?	NA	H-C, C-c	NA	H-d, C-d	NA	H-c, C-c	NA	H-d, C-d	NA	H-d, C-d
Frito Lay	31	0.8 (English Kills)	Brooklyn	Yes	Adjacent	No	Bagging/rope storage, lime and cement shed; building materials storage; and metal scrap processing facility	Vacant lot	Historical scrap metal processing operations	Residual contamination from historical scrap metal processing operations (remedial planning in progress)	VOC, CVOC, SVOC, PAH, M, PCB	VOC, M	H-a, C-a	N	NA	H-b, C-b	NA	H-c, C-c	NA	H-b, C-b	NA	H-b, C-b	NA	H-c, C-c

Table 5-3
Source Table

Site Name	DAR No.	Creek Mile	Borough	Adjacent to Creek	Distance to Creek	Respon-dent Site	Historical site use (i.e., industries)	Current site use (i.e., industry)	Historical Potential Areas of Concern (i.e., sources)	Current Potential Areas of Concern (i.e., sources)	Potential COPCs	Pathway Summary											
												Groundwater			Direct Discharge				Discharge to Sewer/CSO		Overland Transport		Bank Erosion	
															Stormwater/ Wastewater		Overwater							
												Documented COPCs	Pathway Status	NAPL	Documented COPCs	Pathway Status	Documented COPCs	Pathway Status	Documented COPCs	Pathway Status	Documented COPCs	Pathway Status	Documented COPCs	Pathway Status
Getty Terminals Corp. #58220	47	NTC 1.16 – 1.33	Queens	Yes	Adjacent	No	Lumber yard; gasoline storage and distribution	Gasoline storage and distribution	Lumber storage areas, and historical spills	Petroleum storage tanks and conveyance pipelines, truck loading rack, garage-diesel fueling area, overwater mooring area, gasoline and waste oil ASTs/USTs, waste accumulation areas, and spills	TPH, PAH, M, BTEX, VOC	BTEX, SVOC	H-a, C-b	Y	BTEX	H-a, C-a	NA	H-b, C-b	NA	H-c, C-c	TPH	H-a, C-b	NA	H-c, C-c
Goodman Brothers Steel Drum	122	NA	Brooklyn	No	0.51 mile	No	Steel drum reconditioning	Construction sand and gravel	Drum scour and rinse area; chemical storage area; No 2 fuel oil USTs, and hydrochloric acid ASTs	No. 2 fuel oil USTs; stormwater system (including oil water separator and oil collection trough)	VOC, SVOC, PAH, M	NA	H-c, C-c	?	NA	H-d, C-d	NA	H-d, C-d	NA	H-d, C-d	NA	H-d, C-d	NA	H-d, C-d
Greenpoint Energy Center	32	2.5	Brooklyn	Yes	Adjacent	Yes	Glue and glass factories, MGP, coke oven gas plant, water gas plant, oil gas plant, and SNG plant	LNG facility; gas transmission and operations support	Spills and USTs	Spills	VOC, BTEX, PAH, SVOC, PCB, M, DF, TPH, CVOC, PHT, PHN	VOC	H-c, C-c	N	NA	H-c, C-c	NA	H-c, C-c	NA	H-c, C-c	NA	H-c, C-c	NA	H-c, C-c
Greenpoint Marine Transfer Station and Incinerator	11b	0.85 – 1	Brooklyn	Yes	Adjacent	Yes	Oil storage and unknown type of refining, incinerator, transfer station, and warehouse	Warehouse, construction staging for wastewater treatment plant	Oil storage and refining areas, tanks and pipes, residual soil and groundwater contamination, incinerator building, 5,000 gallon UST, and a spill	Construction staging areas	TPH, SVOC, HP, M, VOC, PAH, BTEX	VOC, SVOC, M	H-c, C-c	N	NA	H-b, C-c	NA	H-c, C-d	NA	H-c, C-c	NA	H-c, C-c	NA	H-c, C-c
Grover Cleveland High School	3	NA	Queens	No	0.61 mile	Yes	School since 1930	School	NA	NA	NA	NA	H-d, C-d	?	NA	H-d, C-d	NA	H-d, C-d	NA	H-d, C-d	NA	H-d, C-d	NA	H-d, C-d
Hardchrome Electro Plating, Inc.	124	NA	Brooklyn	No	0.66 mile	No	Lumber storage yard; magnesium casting and cleaning; and electroplater and metal finisher	Employment agency	Processing areas and equipment used in magnesium casting and cleaning and electroplating operations	NA	VOC, SVOC, M, CVOC	NA	H-d, C-d	?	NA	H-d, C-d	NA	H-d, C-d	NA	H-d, C-d	NA	H-d, C-d	NA	H-d, C-d
Hugo Neu Schnitzer	125	NTC 0.9 – 1.1 Dutch Kills 0 – 0.1	Queens	Yes	Adjacent	No	Unloading manure from barges to rail cars	Scrap metal and recycling yard	Railroad cars and tracks; gasoline, diesel, and No. 2 fuel oil USTs; and petroleum ASTs	Inbound scrap metals and recyclables; machinery; diesel, used oil, and lube oil ASTs	TPH, BTEX, VOC, SVOC, PAH, M, PCB, PTH	NA	H-c, C-c	?	TPH, M	H-a, C-b	M	H-a, C-b	NA	H-c, C-c	M	H-a, C-c	NA	H-c, C-c
Joseph H. Lowenstein & Sons, Inc.	126	NA	Brooklyn	No	0.33 mile	No	Manufactures dyes, tanning oil, soaps, and other hair and fur preparation agents, including permanent and semi-permanent hair color products	Manufactures dyes, tanning oil, soaps, and other hair and fur preparation agents, including permanent and semi-permanent hair color products	UST/ASTs; chemical storage area; and facility operations	UST/ASTs; chemical storage area; and facility operations	TPH, BTEX, VOC, SVOC, PAH, M	NA	H-b, C-b	?	NA	H-d, C-d	NA	H-d, C-d	M, SVOC, VOC	H-d, C-d	NA	H-d, C-d	NA	H-d, C-d

Table 5-3
Source Table

Site Name	DAR No.	Creek Mile	Borough	Adjacent to Creek	Distance to Creek	Respon-dent Site	Historical site use (i.e., industries)	Current site use (i.e., industry)	Historical Potential Areas of Concern (i.e., sources)	Current Potential Areas of Concern (i.e., sources)	Potential COPCs	Pathway Summary											
												Groundwater			Direct Discharge				Discharge to Sewer/CSO		Overland Transport		Bank Erosion	
															Stormwater/ Wastewater		Overwater							
												Documented COPCs	Pathway Status	NAPL	Documented COPCs	Pathway Status	Documented COPCs	Pathway Status	Documented COPCs	Pathway Status	Documented COPCs	Pathway Status	Documented COPCs	Pathway Status
Kalex Chemical Products, Inc.	127	0.3	Brooklyn	No	0.04 mile	No	Cutting/selling of lumber and production of vinyl products	Manufacturing of unlaminated plastics and films (vinyl film)	Boiler room sump, USTs, illicit discharges to sewer, and hazardous waste storage	Boiler room sump, USTs, and hazardous waste storage	TPH, BTEX, CVOC, M	NA	H-c, C-c	?	TPH, BTEX, CVOC, M	H-a, C-b	NA	H-d, C-d	TPH, BTEX, CVOC, M	H-a, C-b	NA	H-d, C-d	NA	H-d, C-d
Levco Metals Property	131	NA	Queens	No	1.25 miles	No	Storage warehouses, gas company customer service department, and metal finishing (including plating, polishing, anodizing, and spraying)	Parking lot	Two storage buildings, two gas tanks, products used in metal finishing practices and operations (including sulfuric anodizing, chromic, hard coating, spraying, polishing, and plating), equipment used in metal finishing practices and operations (including a concrete sump area), one AST, one UST, and one spill	UST	TPH, VOC, CVOC, M	VOC, M	H-d, C-d	Y	NA	H-c, C-c	NA	H-d, C-d	NA	H-c, C-c	NA	H-d, C-d	NA	H-d, C-d
LIRR Long Island City Freight Yard (AOC 1)	128	NA	Queens	No	0.40 mile	No	Gasoline service station and solid waste management facility	Lumber yard	Gasoline USTs; petroleum conveyance pipelines and fueling areas; solid waste handling areas	Lumber storage areas	TPH, BTEX, VOC, SVOC, PAH, M	VOC, SVOC, M, PAH	H-d, C-d	?	NA	H-d, C-d	NA	H-d, C-d	NA	H-c, C-c	NA	H-d, C-d	NA	H-d, C-d
LIRR Long Island City Freight Yard (AOC 2)	129	NA	Queens	No	0.27 mile	No	Gasoline service station	Vacant lot	Gasoline and No. 2 fuel oil USTs, petroleum conveyance pipelines, and fueling areas, and a spill	NA	TPH, BTEX, VOC, SVOC, PAH	TPH	H-d, C-d	?	NA	H-c, C-c	NA	H-d, C-d	NA	H-c, C-c	NA	H-d, C-d	NA	H-d, C-d
Manhattan Poly Bag	130	0.55 (English Kills)	Brooklyn	Yes	Adjacent	No	Asphalt production, oil company, and a warehouse	Plastics, foil, and coated paper bags manufacturer, and warehouse and distribution operations	Products and equipment used in asphalt production (including asphalt and tar tanks, boiler room, and kettles), oil company operations, warehouse operations, AST and USTs, and a spill	Equipment and products used in plastics, foil, and coated paper bags manufacturer, and warehouse and distribution operations	TPH, VOC, SVOC, M	VOC, SVOC, M	H-a, C-c	N	NA	H-b, C-c	NA	H-c, C-c	NA	H-c, C-c	TPH	H-c, C-c	NA	H-c, C-c
Maspeth Project	35	NA	Queens	No	0.34 mile	Yes	Storage yard for yellow school buses	Vacant lot	School bus storage areas; 20,000-gallon No. 2 fuel oil UST	NA	TPH, SVOC, M, VOC, HP, PCB	VOC, SVOC, M, TPH, HP, PCB	H-b, C-c	Y	NA	H-c, C-c	NA	H-d, C-d	NA	H-c, C-c	NA	H-d, C-d	NA	H-d, C-d
Metro Terminal	52	NTC 1.53 – 1.65	Brooklyn	Yes	Adjacent	No	Fuel storage and transfer facility, chemical manufacturing, stone cutting, boiler works, and lumber storage	Petroleum bulk storage and distribution	Areas in which chemical manufacturing, lime storage, lumber storage, stone cutting, vehicle maintenance and fueling, and petroleum storage and transfer occurred	Current areas of concern include tanks, pipelines, and ancillary equipment used for the transfer and storage of petroleum products	TPH, VOC, BTEX, SVOC, M, PAH	NA	H-c, C-c	?	NA	H-a, C-b	NA	H-b, C-b	NA	H-c, C-c	TPH	H-a, C-b	NA	H-c, C-c

Table 5-3
Source Table

Site Name	DAR No.	Creek Mile	Borough	Adjacent to Creek	Distance to Creek	Respon-dent Site	Historical site use (i.e., industries)	Current site use (i.e., industry)	Historical Potential Areas of Concern (i.e., sources)	Current Potential Areas of Concern (i.e., sources)	Potential COPCs	Pathway Summary												
												Groundwater			Direct Discharge				Discharge to Sewer/CSO		Overland Transport		Bank Erosion	
												Documented COPCs	Pathway Status	NAPL	Stormwater/ Wastewater		Overwater		Documented COPCs	Pathway Status	Documented COPCs	Pathway Status	Documented COPCs	Pathway Status
															Documented COPCs	Pathway Status	Documented COPCs	Pathway Status						
Morgan Oil Terminal, Brooklyn	60	0.8 (English Kills)	Brooklyn	Yes	Adjacent	No	Brick and lime storage, asphalt manufacturer, metal incinerator, coal distributor, salt distributor, sawmill, and oil manufacturer and distributor	Undergoing remediation for future redevelopment	Equipment and products used in oil storage and distribution practices and operations (including USTs, ASTs, mounded tanks, conveyance piping, and ancillary equipment), historical overwater activities at dock (including loading/unloading petroleum products from barges), equipment and products used in historical upland practices and operations (including asphalt manufacturing, coal and salt distribution, brick and lime storage, and sawmill operations), and spills	Current overwater activities and a loading rack	TPH, BTEX, VOC, CVOC, SVOC, PAH, M	TPH, VOC, BTEX, CVOC	H-a, C-c	Y	TPH	H-a, C-b	TPH	H-a, C-c	TPH	H-a, C-c	TPH	H-a, C-c	TPH	H-b, C-c	NA	H-c, C-c
Motiva Brooklyn Terminal	50	0.6	Brooklyn	Yes	Adjacent	No	Lumber and box company, receipt, storage, and transfer of petroleum products	Receipt, storage, and transfer of petroleum products	Lumber storage areas, USTs/ASTs, underground pipelines, upland spills, ancillary equipment and facilities, fuel loading rack, marine terminal diesel rack, Tosco fleet maintenance area, and releases during product transfer from vessels	USTs/ASTs, underground pipelines, upland spills, ancillary operational equipment and facilities, fuel loading rack, marine terminal diesel rack, Tosco fleet maintenance area, and releases during product transfer from vessels	BTEX, TPH, VOC, SVOC, PAH, M	TPH, BTEX, VOC	H-a, C-b	Y	BTEX, TPH	H-a, C-a	TPH	H-a, C-a	BTEX, TPH	H-c, C-c	NA	H-b, C-b	NA	H-b, C-c
Newtown Creek Wastewater Treatment Plant	11a	0.85 – 1	Brooklyn	Yes	Adjacent	Yes	Gasoline terminal, storage yard, bronze works, lumber yard, steel products factory, and office	Wastewater treatment plant	On-site LNAPL plume, upland soil contamination, USTs/ASTs (diesel and gasoline), loading racks, gasoline/oil transfer activities, and spills (diesel, No. 2 fuel oil, hydraulic oil, lube oil, raw sewage, sodium hypochlorate, motor oil, and sludge)	UST/AST (diesel/used oil), drum storage (lubricants and used oils), loading racks, gasoline/oil transfer activities	TPH, VOC, M, PAH, PCB, BTEX, SVOC, CVOC, MTBE	TPH, MTBE, VOC, SVOC	H-b, C-c	Y	NA	H-c, C-c	NA	H-d, C-d	M	H-c, C-c	NA	H-c, C-d	NA	H-c, C-d
NYCON Supply Corporation	58	Dutch Kills 0.55	Queens	Yes	Adjacent	No	Concrete manufacturer	Ready-mix concrete manufacturer	Equipment and products used in concrete manufacturing and distribution	Equipment and products used in concrete manufacturing and distribution; diesel and No. 2 fuel oil USTs; and waste oil AST	TPH, VOC, SVOC, PAH, PCB	NA	H-c, C-c	?	NA	H-b, C-b	NA	H-b, C-c	NA	H-c, C-c	NA	H-b, C-b	NA	H-c, C-c
NYCT - Fresh Pond Depot	18	NA	Queens/ Brooklyn	No	1.41 miles	No	Auto repairs	Bus depot and maintenance operations; waste handling	Auto repair and maintenance areas; diesel ASTs; and gasoline and lube oil USTs	Bus operation, equipment, and maintenance; chemical storage tank; diesel and waste oil USTs; and lube oil AST	TPH, BTEX	NA	H-c, C-c	?	NA	H-c, C-c	NA	H-d, C-d	NA	H-c, C-c	NA	H-d, C-d	NA	H-d, C-d
NYCT - Kisco Lot	13	NA	Queens	No	0.31 mile	No	NYCT waste accumulation area	NYCT waste accumulation area	Waste accumulation area	Waste accumulation area	M	NA	H-c, C-c	?	NA	H-c, C-c	NA	H-d, C-d	NA	H-c, C-c	NA	H-d, C-d	NA	H-d, C-d

Table 5-3
Source Table

Site Name	DAR No.	Creek Mile	Borough	Adjacent to Creek	Distance to Creek	Respon-dent Site	Historical site use (i.e., industries)	Current site use (i.e., industry)	Historical Potential Areas of Concern (i.e., sources)	Current Potential Areas of Concern (i.e., sources)	Potential COPCs	Pathway Summary													
												Groundwater			Direct Discharge				Discharge to Sewer/CSO		Overland Transport		Bank Erosion	
												Documented COPCs	Pathway Status	NAPL	Stormwater/ Wastewater		Overwater		Documented COPCs	Pathway Status	Documented COPCs	Pathway Status	Documented COPCs	Pathway Status
															Documented COPCs	Pathway Status	Documented COPCs	Pathway Status						
NYCT Crosstown Annex Facility	20	0.2	Brooklyn	Yes	Adjacent	No	Sugar refining, trolley car storage and washing facility, and bus washing and painting facility	Potentially paint shop and road service operations	Historical sugar refining operations, paint spray booths and washing areas, and storage of petroleum products	Paint spray booths and washing areas and storage of petroleum products	VOC, SVOC, TPH	NA	H-c, C-c	?	NA	H-c, C-c	NA	H-c, C-c	NA	H-c, C-c	NA	H-c, C-c	NA	H-c, C-c
NYSDOT BIN 1075910	21	2.1	Queens	Yes	Adjacent	No	Site has been occupied by the Kosciuszko Bridge (1-278 Brooklyn-Queens Expressway) since 1939	Kosciuszko Bridge (1-278 Brooklyn-Queens Expressway) since 1939	Vehicular traffic on the bridge and waste generation activities	Vehicle traffic on bridge	TPH, BTEX, M	NA	H-c, C-c	?	NA	H-c, C-c	NA	H-c, C-c	NA	H-c, C-c	NA	H-c, C-c	NA	H-c, C-c
Outlet City	132	NA	Queens	No	0.35 mile	No	Disinfectant manufacturer, expanded product line to include soaps, deodorants, floor maintenance products, dermatitis controls, insecticides, paper towels, tamed iodine (R), detergents, germicides, and pharmaceuticals	Offices and a warehouse for retail stores	Western and southwest portion of site (Areas B, D, E, F, and G) – Creosote AST and raw materials for disinfectant manufacture; two USTs	Residual contamination following remedial activities (vapor mitigation and LNAPL recovery system in place)	TPH, VOC, BTEX, SVOC, PAH, PHN, HP	VOC, BTEX, SVOC, M	H-b, C-b	Y	NA	H-d, C-d	NA	H-d, C-d	NA	H-d, C-d	NA	H-d, C-d	NA	H-d, C-d
Pebble Lane Associates	134	NTC 2.7 – 8.0	Queens	Yes	Adjacent	No	Recycling of clean fill material; maintenance and parking of trucks used for hauling petroleum products	Solid waste transfer facility; glass recycling; and maintenance and parking of petroleum hauling trucks	Transportation equipment and USTs	Construction and demolition debris tipping, sorting, crushing and stockpiling; transportation equipment; diesel UST; and used oil and motor oil AST	TPH, VOC, SVOC, PAH, M	NA	H-c, C-c	?	NA	H-a, C-b	NA	H-c, C-c	NA	H-c, C-c	TPH	H-a, C-b	NA	H-c, C-c
Pinkas Fischer	136	2.1	Brooklyn	No	0.07 mile	No	Dry rendering and warehouse/storage	Parking lot	Former meat processing areas	Spills in parking lot	TPH, M, VOC, SVOC	NA	H-c, C-c	?	NA	H-a, C-c	NA	H-d, C-d	NA	H-c, C-c	NA	H-d, C-d	NA	H-d, C-d
Popular Hand Laundry	38	NA	Brooklyn	No	0.10 mile	No	Skein dyeing, industrial dry cleaner, and laundry facility	Storage and restoration of antique furniture and artwork	Equipment and products used in skein dyeing and industrial dry cleaning and laundry processes and operations (including a UST)	Equipment and products used in restoring antique furniture and artwork	TPH, CVOC, SVOC, VOC, M	VOC, CVOC, SVOC, M	H-a, C-c	N	NA	H-c, C-c	NA	H-d, C-d	NA	H-b, C-c	NA	H-d, C-d	NA	H-d, C-d
PV Knit Goods Processing	137	NA	Brooklyn	No	1.49 miles	No	Garage and warehouse buildings, metal novelties manufacturing, and textile dyer	Textile machinery manufacturing	Metal novelties manufacturing, textile dying, cotton finishing, wastewater discharges, and an AST	Textile machinery manufacturing and an AST	BTEX, M, TPH	NA	H-d, C-d	?	M, TPH	H-b, C-b	NA	H-d, C-d	M, TPH	H-c, C-c	NA	H-d, C-d	NA	H-d, C-d

Table 5-3
Source Table

Site Name	DAR No.	Creek Mile	Borough	Adjacent to Creek	Distance to Creek	Respon-dent Site	Historical site use (i.e., industries)	Current site use (i.e., industry)	Historical Potential Areas of Concern (i.e., sources)	Current Potential Areas of Concern (i.e., sources)	Potential COPCs	Pathway Summary											
												Groundwater			Direct Discharge				Discharge to Sewer/CSO		Overland Transport		Bank Erosion	
															Stormwater/ Wastewater		Overwater							
												Documented COPCs	Pathway Status	NAPL	Documented COPCs	Pathway Status	Documented COPCs	Pathway Status	Documented COPCs	Pathway Status	Documented COPCs	Pathway Status	Documented COPCs	Pathway Status
Quanta Resources	39	1.6	Queens	No (ease-ment to creek)	0.08 mile	No	Gasoline, kerosene, astral, distillate fuel oils, light and heavy fuel oils manufacturing, refine used crankcase oil and petroleum waste products, recycling, processing and storing used and unused oils, solvents, and miscellaneous waste materials, and remedial investigations and activities	Truck parking or storing tractor trailer trucks	Tank farm, overwater product transfer via pipelines, on-site waste disposal, on-site operations (including oil recycling, disposal and re-refining, processing and storage or waste and lubricating oil), discharge of wastes to the municipal sewer, open-diked containments areas, open drums, vats and metal tanks in poor condition, on-site lagoon, oil water separator and boiler blowdown discharges to creek, and off-site LNAPL plumes, and historical spills	On-site and off-site LNAPL plume	VOC, SVOC, M, PAH, PCB, TPH, CVOC	VOC, SVOC, M, PAH, PCB, TPH, CVOC	H-b, C-b	Y	NA	H-a, C-b	NA	H-b, C-c	NA	H-c, C-c	TPH	H-b, C-c	NA	H-c, C-c
Queens District 5/5a Garage	45	NTC 2.65 – 2.7	Queens	Yes	Adjacent	Yes	Truck freight hauling; radio station	Sanitation truck storage and maintenance facility	Trucks; petroleum USTs, ancillary equipment, and spills	Truck storage, maintenance, washing, and refueling; and petroleum USTs (gasoline, biodiesel, used oil, hydraulic oil, and No. 2 fuel oil)	TPH, BTEX, VOC, SVOC, PAH, M	NA	H-c, C-c	?	NA	H-a, C-c	NA	H-c, C-c	TPH	H-c, C-c	NA	H-b, C-b	NA	H-c, C-c
Queens West (Hunter's Point) Center Boulevard	133	NA	Queens	No	0.34 mile	No	Chemical company, asphalt company, varnish works, gum storage, barrel manufacturer, plumbing supply manufacturer, auto repair, and insecticide manufacturer	Paved road with underground utilities, a public park, a vacant lot, and a residential/commercial building called the Avalon Riverview North Building	Former USTs; former manufacturing and processing areas	Potential residual contamination following remedial activities from former USTs and former manufacturing/process area	TPH, BTEX, VOC, SVOC, M, PCB, HP	TPH, VOC, SVOC, PAH, M, PHN	H-c, C-c	Y	NA	H-d, C-d	NA	H-d, C-d	NA	H-d, C-d	NA	H-d, C-d	NA	H-d, C-d
Queens West (Hunter's Point) Parcel 11	138	NA	Queens	No	0.27 mile	No	Former rail road operations (freight yard); Phthalic Hydride and Maleic Phydride production; metal works	Residential/commercial buildings called the Avalon Riverview and Riverview Gardens	Contaminated fill material; rail road operations; metal works	Residual contamination following remedial activities	TPH, BTEX, VOC, SVOC, M, PCB, HP	VOC, SVOC	H-c, C-c	N	NA	H-d, C-d	NA	H-d, C-d	NA	H-d, C-d	NA	H-d, C-d	NA	H-d, C-d
Remco Maintenance LLC	19	NA	Queens	No	0.44 mile	No	Truck and fire apparatus manufacturer, hat manufacturer, gasoline meter manufacturer, newspaper distributor	Restoration and maintenance services for metals, marble, wood, and glass	Body and paint shop; service station; equipment and products associated with hat manufacturing and gasoline meter manufacturing; and USTs and ASTs with diesel, No. 2 fuel oil, and lube oil	Equipment and products used in metals, marble, wood, and glass restoration	TPH, VOC, PCB, M, PHN	NA	H-c, C-c	?	NA	H-c, C-c	NA	H-d, C-d	NA	H-c, C-c	NA	H-d, C-d	NA	H-d, C-d

Table 5-3
Source Table

Site Name	DAR No.	Creek Mile	Borough	Adjacent to Creek	Distance to Creek	Respon-dent Site	Historical site use (i.e., industries)	Current site use (i.e., industry)	Historical Potential Areas of Concern (i.e., sources)	Current Potential Areas of Concern (i.e., sources)	Potential COPCs	Pathway Summary											
												Groundwater			Direct Discharge				Discharge to Sewer/CSO		Overland Transport		Bank Erosion	
												Documented COPCs	Pathway Status	NAPL	Stormwater/ Wastewater		Overwater		Documented COPCs	Pathway Status	Documented COPCs	Pathway Status	Documented COPCs	Pathway Status
															Documented COPCs	Pathway Status	Documented COPCs	Pathway Status						
Rencoa, Inc.	139	2.1	Brooklyn	No	0.01 mile	No	Tallow and grease manufacturer, fat rendering, waste transfer station, and recyclables handling	Solid waste transfer station and recyclable handling and recovery	Former rendering process areas, UST/AST, transportation equipment, domestic discharges, and C&D debris piles	UST/AST, transportation equipment, domestic discharges, and C&D debris piles	TPH, BTEX, VOC, M, PAH, SVOC	NA	H-b, C-b	?	NA	H-a, C-b	NA	H-d, C-d	NA	H-c, C-c	NA	H-b, C-b	NA	H-d, C-d
Review Avenue Development I	41	1.45 – 1.6	Queens	Yes	Adjacent	No	Brewery, animal rendering (fat melters, glue makers, bone buyers, hide dealers, poultry feed), fertilizer manufacturers, oil refining, coal terminal, transfer station for construction and demolition materials, heavy equipment storage, zinc alloy and metal manufacturing, asphalt recycling, trucking, and vehicle fueling and maintenance	Rental equipment for film and television industry (including a terminal, parking, warehouse, shop, and office space) and asphalt recycling/ transfer station	Petroleum storage and handling (UST/AST/pipelines/ancillary infrastructure), coal storage, oil tank trench, underground sump, vehicle fueling and maintenance activities, loading/ unloading barges, conveyance pipelines from wharf to upload areas, Quanta LNAPL plume (off site), sanitary waste, boiler blowdown, cooling and process water discharge from former Van Iderstine plant, Quanta stormwater/ wastewater pipelines, C&D materials, asphalt waste transfer, fertilizer manufacturing, zinc alloy and metal manufacturing, and spills	Petroleum storage and handling (UST/AST/pipelines/ancillary infrastructure), coal storage, oil tank trench, underground sump, vehicle fueling and maintenance activities, Quanta LNAPL plume (off site), Quanta stormwater/ wastewater pipelines, and asphalt waste transfer	TPH, VOC, CVOC, SVOC, M, PAH, PCB	TPH, VOC, CVOC, PAH, M, PCB	H-b, C-b	Y	NA	H-a, C-b	NA	H-b, C-c	NA	H-c, C-c	NA	H-b, C-c	NA	H-b, C-c
Rhoda Uretsky Trust	14	NA	Brooklyn	No	0.22 mile	No	Scrap metal smelting/ recycling and restaurant equipment repair	Restaurant equipment repair	Products and equipment used and activities performed during smelting and recycling scrap metal operations (including non-ferrous ingots production and site discharges), restaurant equipment repair practices and operations, and an UST	Products and equipment used in restaurant equipment repair practices and operations	M, TPH	NA	H-c, C-c	?	NA	H-c, C-c	NA	H-d, C-d	NA	H-c, C-c	NA	H-d, C-d	NA	H-d, C-d
Roehr Chemicals, Inc.	42	NA	Queens	No	0.23 mile	No	Stone cutting and granite polishing; dry cleaning; precious metal works; pharmaceutical manufacturing	Packaged food warehouse	Processing areas and equipment used in dry cleaning, stone cutting and polishing, pharmaceutical manufacturing, and metal working, including a wastewater treatment system; No. 2 fuel oil, isopropanol, methanol, xylene USTs; chemical ASTs; and spills	Food packaging areas	TPH, VOC, CVOC, PHN, M, SVOC	VOC, CVOC	H-a, C-c	N	NA	H-c, C-c	NA	H-d, C-d	BTEX, VOC, CVOC	H-a, C-c	NA	H-d, C-d	NA	H-d, C-d

Table 5-3
Source Table

Site Name	DAR No.	Creek Mile	Borough	Adjacent to Creek	Distance to Creek	Respon-dent Site	Historical site use (i.e., industries)	Current site use (i.e., industry)	Historical Potential Areas of Concern (i.e., sources)	Current Potential Areas of Concern (i.e., sources)	Potential COPCs	Pathway Summary											
												Groundwater			Direct Discharge				Discharge to Sewer/CSO		Overland Transport		Bank Erosion	
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															Documented COPCs	Pathway Status	Documented COPCs	Pathway Status						
S&L Metal Products Corp.	142	NA	Queens	No	0.50 mile	No	Precision machine products manufacturer, custom made hydraulic assemblies manufacturer, metal polishing and finishing, and electroplating	Operations conducted by Global Window and Door Manufacturing Company, Pierpont Mechanical, Tilos Plumbing and Heating Corporation, and Triple B Cleaning of New York, Inc. (cleaning and maintenance of kitchen exhaust systems)	Processing areas, equipment and products used in precision machine products manufacturing, custom made hydraulic assemblies manufacturing, metal polishing and finishing (including metal finishing operations in the manufacturing of hydraulic/pneumatic assemblies for the aerospace industry), electroplating processes and operations, and drum/barrels used to store company-generated hazardous waste	Products and equipment used in cleaning and maintenance of kitchen exhaust systems and areas and sources associated to operations conducted by Global Window and Door Manufacturing Company, Pierpont Mechanical, and Tilos Plumbing and Heating Corporation	CVOC, VOC, SVOC, PAH, M, TPH	NA	H-c, C-c	?	NA	H-c, C-c	NA	H-d, C-d	TPH, M, VOC	H-a, C-c	NA	H-d, C-d	NA	H-d, C-d
Silverman Gorf, Inc.	141	NA	Brooklyn	No	1.63 miles	No	Metal plater	Metal plater	Metals plating/finishing operations	Metals plating/finishing operations	M, TPH, CVOC, PCB, SVOC	NA	H-c, C-c	?	NA	H-c, C-c	NA	H-d, C-d	M	H-c, C-c	NA	H-d, C-d	NA	H-d, C-d
Soap Manufacturer and Lacquer Storage	104	2.3	Brooklyn	No	0.28 mile	No	Lacquer storage, soap powder manufacture, and cleaning products manufacture	NA	ASTs and manufacturing operations	NA	VOC, CVOC	VOC, CVOC	H-c, C-c	?	NA	H-c, C-c	NA	H-d, C-d	NA	H-c, C-c	NA	H-d, C-d	NA	H-d, C-d
STAR Corrugated Box Co.	143	NA	Queens	No	0.35 mile	No	Manufacturer of corrugated boxes and displays	Manufacturer of corrugated boxes and displays	Processing areas and equipment used in corrugated box manufacturing; No. 6 fuel oil AST and diesel and No. 2 fuel oil UST (including pipelines, and ancillary equipment used to transport and store petroleum products); and spills	Processing areas and equipment used in corrugated box manufacturing and No. 2 fuel oil AST	TPH, BTEX, VOC, CVOC, SVOC, PCB	VOC, CVOC, SVOC	H-b, C-b	Y	NA	H-c, C-c	NA	H-d, C-d	NA	H-c, C-c	NA	H-d, C-d	NA	H-d, C-d
Structural Processing Corp.	144	NA	Queens	No	0.66 mile	No	NA	Architectural metal finisher specializing in anodizing	NA	Processes and equipment associated with spray painting, electroplating, and anodizing aluminum parts; UST; and chemical drums	TPH, VOC, SVOC, PAH, M	NA	H-c, C-c	?	NA	H-c, C-c	NA	H-d, C-d	M	H-a, C-b	NA	H-d, C-d	NA	H-d, C-d
TBTA Queens Midtown Tunnel	15	NA	Queens	No	0.10 mile	No	Drug manufacturer; second-hand building materials storage; window sash storage; and lumber yard and sawmill	Entrance and toll booth for the Queens Midtown Tunnel of the Long Island Expressway	Lumber yard; drug processing and manufacturing areas; and waste oil UST and No. 2 fuel oil AST/UST	Vehicle lanes and parking area; and gasoline and biodiesel USTs	TPH, BTEX, VOC, SVOC, M, PAH	TPH	H-b, C-b	?	NA	H-c, C-c	NA	H-d, C-d	NA	H-c, C-c	NA	H-d, C-d	NA	H-d, C-d

Table 5-3
Source Table

Site Name	DAR No.	Creek Mile	Borough	Adjacent to Creek	Distance to Creek	Respon-dent Site	Historical site use (i.e., industries)	Current site use (i.e., industry)	Historical Potential Areas of Concern (i.e., sources)	Current Potential Areas of Concern (i.e., sources)	Potential COPCs	Pathway Summary											
												Groundwater			Direct Discharge				Discharge to Sewer/CSO		Overland Transport		Bank Erosion	
												Documented COPCs	Pathway Status	NAPL	Stormwater/ Wastewater		Overwater		Documented COPCs	Pathway Status	Documented COPCs	Pathway Status	Documented COPCs	Pathway Status
															Documented COPCs	Pathway Status	Documented COPCs	Pathway Status						
Technical Metal Finishers	43	NA	Brooklyn	No	0.45 mile	No	Dairy products; electroplating, metal finishing, nondestructive testing, and painting until a 1982 fire uncovered significant environmental concerns at facility	Facility demolished, current use is unknown; possibly used as storage/parking lot	Dairy operations; New York City operations; metal plating and polishing material processing activities; abandoned chemical vats; and tank and drum storage areas	Potential residual contamination following remedial activities from former waste handling areas (waste and soil removal performed)	VOC, SVOC, M	NA	H-c, C-c	?	NA	H-c, C-c	NA	H-d, C-d	NA	H-c, C-c	NA	H-d, C-d	NA	H-d, C-d
Troutman Street Venturi Flow Chamber	10	NA	Brooklyn	No	0.40 mile	Yes	Concrete vault used to house metering equipment to monitor the flow rates and pressure within water supply mains	Equipment and sidewalk hatchway has been removed, the vault is backfilled to grade, and the area is cemented over	Spill (i.e., during decommissioning of the former water flow metering equipment, elemental mercury was released into the chamber as the meter was being dismantled)	NA	M	NA	H-c, C-c	?	NA	H-d, C-d	NA	H-d, C-d	NA	H-d, C-d	NA	H-d, C-d	NA	H-d, C-d
Tru-Tone Metal Products	146	NA	Brooklyn	No	0.48 mile	No	Aluminum anodization and painting	Active aluminum anodization and painting	Fuel oil UST; anodizing and painting operations	Fuel oil UST; anodizing and painting operations	TPH, VOC, M	NA	H-c, C-c	?	M	H-c, C-c	NA	H-d, C-d	M	H-a, C-b	NA	H-d, C-d	NA	H-d, C-d
United Envelope	17	NA	Queens	No	0.37 mile	No	Automobile sales and repairs	Envelope printing/manufacturing and production of direct mailings	Parts storage; vehicle repairs and washing; filling station; and No. 2 fuel oil UST	Manufacturing and printing areas	TPH, BTEX	NA	H-c, C-c	?	NA	H-c, C-c	NA	H-d, C-d	NA	H-c, C-c	NA	H-d, C-d	NA	H-d, C-d
Waste Management of NY - 123 Varick Avenue	46	NA	Brooklyn	Yes	Adjacent	No	Manufactured asphalt, sand and gravel, steel pipe fabrication, waste management and recycling, construction and demolition debris, and putrescible waste processing	C&D debris transfer station	Two 275-gallon ASTs containing unknown product , one 1,000-gallon AST containing diesel, one 1,100-gallon AST containing waste oil, and equipment and products used and activities performed manufacturing asphalt and pipe fabrication	C&D debris handling areas (including unauthorized material), two 275-gallon ASTs containing lube oil and waste oil, two 1,000-gallon ASTs containing lube oil and unknown product, one 550-gallon ASTs containing an unknown product	TPH, VOC, BTEX, SVOC, PAH, M	NA	H-c, C-c	?	M, BTEX	H-b, C-a	NA	H-c, C-c	NA	H-c, C-c	NA	H-a, C-b	NA	H-c, C-c
Wilco Finishing Corp.	149	NA	Brooklyn	No	0.51 mile	No	Garage, metal finishing, and electroplating	Electroplating	Equipment and products used and activities performed in electroplating and metal finishing practices and operations (including nickel, chromium, and copper plating; nickel and chromium stripping; acid and alkaline cleaning; acid pickling; electro cleaning and polishing, and site discharges), and one 4,000-gallon UST containing No. 2 fuel oil	Equipment and products used and activities performed in electroplating practices and operations; closed UST	TPH, VOC, SVOC, M	NA	H-c, C-c	?	M	H-d, C-d	NA	H-d, C-d	M	H-a, C-c	NA	H-d, C-d	NA	H-d, C-d

Table 5-3
Source Table

Site Name	DAR No.	Creek Mile	Borough	Adjacent to Creek	Distance to Creek	Respon-dent Site	Historical site use (i.e., industries)	Current site use (i.e., industry)	Historical Potential Areas of Concern (i.e., sources)	Current Potential Areas of Concern (i.e., sources)	Potential COPCs	Pathway Summary													
												Groundwater			Direct Discharge				Discharge to Sewer/CSO		Overland Transport		Bank Erosion	
												Documented COPCs	Pathway Status	NAPL	Stormwater/ Wastewater		Overwater		Documented COPCs	Pathway Status	Documented COPCs	Pathway Status	Documented COPCs	Pathway Status
															Documented COPCs	Pathway Status	Documented COPCs	Pathway Status						
Wing Gong Laundry	150	NA	Brooklyn	No	0.22 mile	No	Former dry cleaner, former tannery, manufacturer of hats and leather goods, and dye house	Industrial laundry	No. 2 fuel oil 5,000-gallon UST; No. 2 fuel oil 3,000-gallon UST; historical manufacturing of hats and leather goods (including a dye house); historical iron works; industrial laundry practices and operations	Industrial laundry practices and operations	TPH, CVOC, SVOC, M, VOC	NA	H-c, C-c	?	NA	H-d, C-d	NA	H-d, C-d	M, TPH	H-d, C-d	NA	H-d, C-d	NA	H-d, C-d

Additional Acronyms:
AST – aboveground storage tank
C&D – construction and demolition
CSO – combined sewer overflow
LNG – liquefied natural gas
MGP – manufactured gas plant
NYCT – New York City Transit
SVE – soil vapor extraction
UST – underground storage tank

Table 6-1
Outfalls by Creek Segment

Outfall Type	No. of Outfalls	Diameter Range
Newtown Creek 1		
Direct Discharge	11	6 inch – 15 inch
General	85	4 inch – 18 inch
Highway Drain	9	4 inch – 8 inch
Major Stormwater	1	NA
SPDES	17	6 inch – 72 inch
Storm Drain	1	90 inch
Dutch Kills		
Direct Discharge	25	3 inch – 12 inch
General	12	4 inch – 48 inch
Highway Drain	11	4 inch – 8 inch
Major Stormwater	1	NA
SPDES	6	12 inch – 30 inch
Storm Drain	3	10 inch – 12 inch
Whale Creek		
Direct Discharge	1	8 inch
General	3	6 inch – 18 inch
Highway Drain	0	None
Major Stormwater	1	NA
SPDES	3	NA - 6 inch
Storm Drain	0	None
Newtown Creek 2		
Direct Discharge	13	4 inch – 18 inch
General	27	4 inch – 48 inch
Highway Drain	0	None
Major Stormwater	2	NA
SPDES	5	3 inch – 48 inch
Storm Drain	3	NA
Newtown Creek 3		
Direct Discharge	11	4 inch – 18 inch
General	29	6 inch – 60 inch
Highway Drain	2	18 inch – 24 inch
Major Stormwater	4	NA
SPDES	4	36 inch – 186 inch
Storm Drain	5	NA
Maspeth Creek		
Direct Discharge	0	None
General	5	26 inch
Highway Drain	2	12 inch – 18 inch
Major Stormwater	0	None
SPDES	1	NA
Storm Drain	0	None

Table 6-1
Outfalls by Creek Segment

Outfall Type	No. of Outfalls	Diameter Range
English Kills		
Direct Discharge	11	4 inch – 6 inch
General	37	3 inch – 60 inch
Highway Drain	1	6 inch
Major Stormwater	4	NA
SPDES	3	NA or 6 inch
Storm Drain	5	48 inch – 60 inch

Notes:

1 – Outfall locations are preliminary, compiled, estimated data based on New York City Department of Environmental Protection (NYCDEP) maps and tabulated data and other resources. Many outfall locations were taken from the New York City Shoreline Survey Program: Newtown Creek Water Pollution Control Plant Drainage Area (NYCDEP 2003b and 2003c). Other locations were taken from an excerpt from a similar report from 2008 (the complete report was not included in files available for review). Finally, some outfall locations were inherited from previous Anchor QEA and Newtown Creek Project work. Latitudinal and longitudinal data provided in the 2003 and 2008 NYCDEP reports were rounded to the nearest second. This resulted in potential outfall location discrepancies of up to approximately 200 feet. All outfall locations are currently under field verification.

2 – SPDES outfalls include combined sewer overflow outfalls and outfalls associated with individual SPDES permits, as shown on Table 6-3.

NA – not available

SPDES – State Pollutant Discharge Elimination System

Table 6-2
SPDES Outfalls by
Creek Segment

Outfall ID[1]	Outfall Type	Size	DAR No.	Site Name
Newtown Creek 1				
NCB-021	CSO	36 inches	Multiple	Multiple
NCB-022		54 inches by 75 inches		
NCB-023		24 inches		
NCB-024		NR		
BB-011		24 inches		
BB-012		24 inches		
BB-013		72 inches		
BB-014		22 inches		
BB-015		15 inches		
BB-043		54 inches		
BB-049		32 inches by 48 inches		
NCB-006131-002	Individual	8 inches	50	Motiva
NCB-0201138		8 inches	110	Con Ed 11th Street Conduit
BB-0200441-001		8 inches	106	Buckeye Pipeline
BB-028452-001		NR	NA	Unknown[2]
BB-0028452-001		8 inches	47	Getty
NCB-0007676-001		6 inches	52	Metro Terminal
Dutch Kills				
BB-004	CSO	78 inches by 39 inches	Multiple	Multiple
BB-009		132 inches by 54 inches		
BB-010		30 inches		
BB-026		108 inches by 54 inches		
BB-040		24 inches		
BB-042		12 inches		
Whale Creek				
NCB-0005339	Individual	6 inches	NA	Unknown
NCB-0005338		NR	NA	Unknown
NCB-002[3]	CSO	3BL 84 inches by 96 inches	Multiple	Multiple
Newtown Creek 2				
NCB-004995-001	Individual	NR	53	Exxon Greenpoint Remediation Project
NCB-0004596		12 inches	48	BP Products of North America
NCB-0110060		3 inches	NA	Unknown
NCB-020930-001		6 inches	NA	Unknown
NCQ-029	CSO	48 inches	Multiple	Multiple

Table 6-2
SPDES Outfalls by
Creek Segment

Outfall ID[1]	Outfall Type	Size	DAR No.	Site Name
Newtown Creek 3				
NCQ-019	CSO	NR	Multiple	Multiple
NCQ-083		NR		
NCB-083		186 inches		
NCB-019		36 inches		
Maspeth Creek				
NCQ-077	CSO	NR	Multiple	Multiple
English Kills				
NCB-0005789-001	Individual	10 inches	123	Gulf Oil Corporation Greenpoint Plant
NCB-0007641-001		6 inches	51	Bayside
NCB-015	CSO	188 inches by 120 inches	Multiple	Multiple

Notes:
1 – Outfall locations are preliminary, compiled, estimated data based on New York City Department of Environmental Protection (NYCDEP) maps and tabulated data and other resources. Many outfall locations were taken from the New York City Shoreline Survey Program: Newtown Creek Water Pollution Control Plant Drainage Area (NYCDEP 2003b and 2003c). Other locations were taken from an excerpt from a similar report from 2008 (the complete report was not included in files available for review). Finally, some outfall locations were inherited from previous Anchor QEA and Newtown Creek Project work. Latitudinal and longitudinal data provided in the 2003 and 2008 NYCDEP reports were rounded to the nearest second. This resulted in potential outfall location discrepancies of up to approximately 200 feet. All outfall locations are currently under field verification.
2 – This outfall may be associated with Getty Terminals Corp. #58220 (DAR Site ID #47).
3 – Outfall 002 is the Newtown Creek wastewater treatment plant high relief that discharges to Whale Creek Canal. This flow is treated before discharge.
CSO – combined sewer overflow
DAR – Data Applicability Report
NA – not available
NR – not reported
SPDES – State Pollutant Discharge Elimination System

Table 6-3
Data Gaps

Site Name	Data Gap Type	DAR No.	Adjacent to Creek	Distance to Creek	Historical site use (i.e., industries)	Current site use (i.e., industry)	Rationale
101-105 West Street	Information	135	No	0.30 mile	Active construction materials storage	Construction materials and equipment storage	The site is located closer to the East River than Newtown Creek and all other pathways (groundwater and conveyance flows in sewer or storm drains) are all to the East River. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
192 Ralph Avenue	Information	23	No	1.80 miles	Former dry cleaner	Commercial rental (unoccupied)	The site is more than 2 miles from the creek. Although there is a potential for upland issues, the site has limited pathway connection potential to Newtown Creek. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
2 Ingraham Street	Information	24	No	0.14 mile	Church, orphanage, parochial school; umbrella manufacturer; metal finishing; zipper manufacturer	Unknown/vacant building	Heavy metals are present in groundwater and uplands have not been fully characterized. Wastewater discharges to the creek prior to permits for metal finishing and plant are discharged to an outfall at the head of English Kills. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
353 McKibbin Street	Information	111	No	0.21 mile	Chemical manufacturer; lacquer spraying facility; paper box storage	Vacant lot	NAPL has been found on the property. EDR and NYSDEC databases report site characterization has occurred and site has been remediated as a Brownfield property. Reports describing thee activities have not been obtained. Stormwater/wastewater discharges to English Kills. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
ACME Steel/Brass Foundry	Information	25	No	0.30 mile	Brass, bronze, and aluminum castings and manufacturer of painted metal products	Marble and granite distribution warehouse	Over time, various chemicals, including oils, waste paints, and solvents, have been stored on site in tanks/drums. While no record of soil or ground water investigations were identified, data collected as part of the NYSDEC Meeker Avenue Plume Trackdown study concluded the site was a source of PCE and TCE contamination. No site-specific information related to surface water or stormwater/wastewater infrastructure was identified. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
ACME Steel/Metal Works	Information	100	No	0.35 mile	Fabricated structural steel, miscellaneous ornamental ironworks, manufacturer of steel doors/frames and steel/glass partitions	Vacant building	Little information on site-specific uplands characterization is available. The site had ASTs (WWT system) and USTs, degreaser dip tank, petroleum impacted soil, paint booths, and several process area floor drains with unknown outfall connections. Information available as part of larger Meeker Avenue Plume Study listed the site as a source for groundwater contamination of TCE and PCE. Whitehead Company and NYSDEC have an AOC to evaluate ACME properties. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
Amtrak Sunnyside Yard	Information	102	No	0.17 mile	Classification, cleaning, and storage of passenger railroad cars	Rail road storage and maintenance facility	Documented groundwater contamination exists at the site. There are ongoing NYSDEC upland investigation for on-site sewers, along with NFAs for five of six components of the RI. Stormwater may discharge to Dutch Kills. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
Architectural Coatings, Inc.	Information	103	No	0.25 mile	Steel-spring mattress, doll, and coated aluminum manufacturer (including electroplating)	Printing and binding	The site discharges to a combined sewer, which may overflow to Newtown Creek. Upland property is not well characterized. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
Atlantic Avenue and Utica Avenue (Crown Heights)	Information	26	No	2.17 miles	Former gas station	Auto retail store (Autozone)	The former gas station and site has an NFA for soil remediation and is now an auto parts retail store. More than 3 miles from the creek, the gas station has not been operational for more than 30 years. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.

Table 6-3
Data Gaps

Site Name	Data Gap Type	DAR No.	Adjacent to Creek	Distance to Creek	Historical site use (i.e., industries)	Current site use (i.e., industry)	Rationale
Atlas Park	Information	1	No	2.70 miles	Knitting mill, wire manufacturing, industrial adhesive manufacturing, and warehousing of various products	Western portion of the site is Shops at Atlas Park; eastern portion of the site is warehouses and commercial buildings	Numerous investigations and remedial actions have been conducted and are still ongoing at the site, the majority to support redevelopment under Brownfield. Groundwater at the site contains VOCs (including PCE and TCE), but due to its distance from the creek and because it has been delineated, it does not appear to be impacting the creek. COPCs reported in soils at the site include PAHs, various metals, PCBs, VOCs, and SVOCs. Information available for review did not discuss stormwater or wastewater infrastructure or practices at the site. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
B.C.F. Oil Refining, Inc.	Information	27	Yes	Adjacent	Former waste oil recycler	Automobile impound lot	USEPA conducted emergency response actions, consisting of site demo and equipment removal and soil and groundwater investigations. There are reported spills to the creek. Impacted groundwater is reportedly influenced by an on-site retaining wall. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
Barker Bros - Ridgewood	Information	2	No	1.70 miles	Manufacturer of buffs and buffing treatments	Manufacturer of buffs and buffing treatments	There is limited information about upland characterization and former on-site USTs and AST. The site is a RCRA LQG. Site connection to the creek exists through potential CSOs to English Kills. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
Bayside Fuel Oil Depot - 1100 Grand St	Physical/ Information	51	Yes	Adjacent	Ice block generator, coal storage, and petroleum storage	Wholesale and retail distribution of petroleum products	Limited information on uplands characterization/investigation was identified in documents available for review. Spills to surface soils and to the English Kills (from barge offloading to the site) occurred in the past on the property, and uplands subsurface contamination has been noted. Stormwater is discharged directly to English Kills from the site and a SPDES permit exists, but no historical permits, DMRs, or stormwater infrastructure mapping was available for review. Further investigation is warranted to determine whether this is a source of significant COPC loading to the creek.
Berger Industries	Information	105	No	1.81 miles	Manufacturer of radio and radio parts; electric welded steel tubing, threaded pipe, lamp parts, electrical fittings, and zinc electroplating	Veterinary clinic and lead paint, asbestos, and mold remediation business	The distance from the creek provides only likely connection via pipe connection but discharge point(s) are unknown. Discharges to the municipal system during the 1980s included spent degreaser solvent, electroplating rinse water, and neutralized acid and bases. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
Buckeye Pipeline Facility	Physical/ Information	106	Yes	Adjacent	Portion of Greenpoint Avenue rail yard	Petroleum pipeline facility	During operations there have been documented releases to the creek, including SPDES permit exceedances, spills, and visual seep releases. Upland investigations conducted on the property have not included all site COPCs. Further investigation is warranted to determine whether this is a source of significant COPC loading to the creek.
Chromium Plating and Polish	Information	108	No	1.51 miles	Former metal plater	Vacant lot	The site is more than 2 miles from Newtown Creek and only 0.2 mile from East River. Groundwater flow from the site is to the East River, and storm sewer flows are to the East River. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
Compudye, Inc.	Information	109	No	0.37 mile	Alcohol warehouse; textile dyeing	Textile dyeing	No information on uplands characterization was identified in documents available for review. Several IWD discharge violations were noted to the sewer. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
Con Edison - 11th Street Conduit	Information	110	Yes	Adjacent	Coal yards and conduit outfall	Electric power distribution	No information on uplands characterization was identified in documents available for review. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.

Table 6-3
Data Gaps

Site Name	Data Gap Type	DAR No.	Adjacent to Creek	Distance to Creek	Historical site use (i.e., industries)	Current site use (i.e., industry)	Rationale
Con Edison - Maspeth Substation	Information	4	No	0.43 mile	Former electrical substation	Textile storage	An Upland RI has been completed, and there are documented on-site releases of COPCs, including PCBs in NAPL. Removal actions are underway. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
Con-Edison Newtown Substation	Information	5	No	0.35 mile	Active electrical substation	Electrical substation	Small parcel and although there is a substation, it appears to have limited opportunity for PCB source to the creek. It is a relatively new substation and source pathways are groundwater or storm drain but no data is available. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
Confort & Company Inc.	Information	6	No	0.08 mile	Furniture and bed springs manufacturer	Printing services	No information on uplands characterization was identified in documents available for review. Wastewater discharges to a combined sewer, with overflow to Dutch Kills. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
Cornish Knit Goods/Cornish Mini-Malls	Information	28	No	0.08 mile	Textile manufacturer; children outerwear manufacturer; illegal dry cleaner; stolen car scrap yard	Shelter and rehabilitation center for homeless men	A number of investigations and remedial activities have been performed since the site entered the VCP in 2000. Two petroleum USTs were closed in place, and later dry cleaning solvents and machinery were removed/disposed, VOC contaminated concrete and soil was excavated, and an AS/SVE system to treat residual PCE and TCE contamination was installed. Groundwater, which generally flows to the east away from the English Kills, is currently monitored monthly. Stormwater and wastewater from the site flows to a combined sewer, which has a connection to English Kills. While an IDW exists for the site, no discharge records were identified. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
East New York Central Maintenance Facility (MTA-NYCT)	Information	7	No	2.45 miles	Active MTA-NYCT maintenance and repair facility	Active MTA-NYCT maintenance and repair facility	The site is located closer to the East River, and conveyance mechanisms (groundwater and piped flow conveyance) drain towards the East River. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
Empire State Varnish Co., Inc.	Information	113	No	0.10 mile	Manufacturer of paints, varnishers, epoxies, and resin solutions	Site purchased to expand existing subsurface oil product recovery system in 2008	Soil and groundwater samples have been collected with numerous exceedances noted. Most site impacts were not associated with historical site activities. While groundwater flows to the creek under static conditions, it is currently controlled by the Greenpoint remedial pumping activities. Some stormwater/wastewater flows directly to the creek (location and extent unknown). Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
Empire Transit Mix, Inc.	Information	59	Yes	Adjacent	Lumber yard, coal storage, trucking company, and concrete mixing/distribution	Concrete manufacturing and distribution	Soil and groundwater samples were collected following the identification of a release decommissioning of 13 USTs. TPH, BTEX, and NAPL were detected. NAPL recovery was performed, and in 1997, NYSDEC issued an NFA for the release. Direct discharge of stormwater to the creek was reported via Outfall NCB-306, with illegal wastewater connections and numerous violations noted. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
Enequist Chemical Co. Inc.	Information	8	No	0.14 mile	Industrial chemical distributor	Food service distributor	Uplands data is not available with groundwater pathway towards the creek and storm drain connections to English Kills. The site has a possible CSO connection to Newtown Creek. Inspections documented illicit discharges in the 1980s. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
Fast Processing, Inc.	Information	114	No	1.86 miles	Textile dye use/manufacturing	Unknown	The site is more than 2 miles from the creek. There is a potential connection to the creek via CSO. The site had exceedances of an IWD permit in the early 2000s but there were no groundwater investigations. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.

Table 6-3
Data Gaps

Site Name	Data Gap Type	DAR No.	Adjacent to Creek	Distance to Creek	Historical site use (i.e., industries)	Current site use (i.e., industry)	Rationale
Former Klink Cosmo Cleaners	Information	101	No	0.40 mile	Industrial dry cleaner	Unknown	Upland property is not well characterized. The Meeker Avenue Plume Trackdown Study detected contaminated groundwater at/near the site. Further information needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
Former NuHart Plastic Manufacturing	Information	29	No	0.09 mile	Piano plate factory, manufacturer of Silexo soap, boiler shop, warehouse, and plastics factory	Plastic and resin manufacturer	There is LNAPL on the uplands site, containing plasticizers and PAHs. There are recovery wells on site and a plume reportedly was delineated. Stormwater/wastewater systems are unknown, and current conditions of groundwater quality and NAPL are unknown. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
Former Spic and Span Cleaners and Dyers, Inc.	Information	115	No	0.27 mile	Silk dyeing and finishing; industrial dry cleaning	Residential; warehouse; woodworking	Stormwater/wastewater is discharged to the East River. Groundwater issues detected as part of Meeker Avenue Plume Trackdown study and NAPL was identified immediately adjacent to site. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
Former W.L.K. Corp.	Information	30	No	0.37 mile	Lubricating oils and grease operations; radiator distribution facility; beer distribution; recycling facility; filling station; and tubular steel products manufacturing	Distributor of lumber and building materials	An RI has been completed, which detected VOCs in groundwater. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
Frito Lay	Information	31	Yes	Adjacent	Bagging/rope storage, lime and cement shed, and a metal scrap processing facility	Site is vacant with no standing structures	Numerous soil and groundwater samples have been collected, and elevated metals, VOCs, SVOCs, and PCBs have been reported in soil or groundwater. Groundwater flows from the site to English Kills. Some stormwater/wastewater discharges directly to English Kills, and some flows to a combined sewer system, which can overflow to English Kills. Sediment samples collected adjacent to the site contained elevated metals and PCBs. Remediation with long-term groundwater monitoring is currently proposed for the site. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
Getty Terminals Corp. #58220	Physical/ Information	47	Yes	Adjacent	Lumber yard; gasoline storage and distribution	Gasoline storage and distribution	Since 2001, numerous spills of gasoline product have been documented on the property, along with a gasoline spill/release to the creek via the sewer line. The site has a SPDES permit and stormwater discharges from the site to Newtown Creek through Outfall 001, and permit limit exceedances have been noted in the past until 1988. No SPDES or discharge records were available to review prior to this. Further investigation is warranted to determine whether this is a source of significant COPC loading to the creek.
Goodman Brothers Steel Drum	Information	122	No	0.51 mile	Steel drum reconditioning	Construction sand and gravel	No groundwater investigation was found in reviewed materials. The site uses have it designated as an RCRA LQG at various times during its history, and the site has 1,000-gallon (or more) USTs. Non-compliance violations for storing hazardous wastes on site without a permit were noted. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
Hardchrome Electro Plating, Inc.	Information	124	No	0.66 mile	Former electroplater and metal finisher	Employment agency	The site is located near the East River (400 feet), and the combined sewer discharges to the East River. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
Hugo Neu Schnitzer	Physical/ Information	125	Yes	Adjacent	Unloading manure from barges to rail cars	Scrap metal and recycling yard	Stormwater from the site passes through an OWS and discharges directly to Dutch Kills (Outfall 1 and 2). This on-site drainage system will overflow when its capacity is exceeded, and during these events, stormwater will bypass the OWS and discharge directly to Dutch Kills. There have been documented releases of residues/materials from site operations to the creek and one instance where a scrap barge sunk after being loaded. An artificial fill site is present over a significant portion of the property with an unknown fill source. Further investigation is warranted to determine whether this is a source of significant COPC loading to the creek.

Table 6-3
Data Gaps

Site Name	Data Gap Type	DAR No.	Adjacent to Creek	Distance to Creek	Historical site use (i.e., industries)	Current site use (i.e., industry)	Rationale
Joseph H. Lowenstein & Sons, Inc.	Information	126	No	0.33 mile	Manufacturer of dyes, tanning oil, soaps, and other hair and fur preparation agents, including permanent and semi-permanent hair color products	Manufactures dyes, tanning oil, soaps, and other hair and fur preparation agents, including permanent and semi-permanent hair color products	There is limited soil data, and no groundwater quality data was found in reviewed documents. The soil data, collected during the closure of two USTs, contained TCLP exceedances for TPH, VOCs, and SVOCs. Groundwater beneath the site flows towards Newtown Creek and stormwater/wastewater discharges to a combined sewer with an overflow to the East River. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
Kalex Chemical Products, Inc.	Information	127	No	0.04 mile	Cutting/selling of lumber and production of vinyl products	Manufacturing of unlaminated plastics and films (vinyl film)	No information on uplands characterization was identified in documents available for review. The property has been used as plastics film and sheet manufacturing since 1978, with numerous USTs, some spills, and documented illegal discharges to sewer. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
Levco Metals Property	Information	131	No	1.25 miles	Storage warehouses; customer service department for East River Gas Co.; plating, anodizing, and spraying metal	Parking lot	The site is more than 1 mile from the creek. Available documentation indicates that groundwater and stormwater pathways are not to Newtown Creek. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
LIRR Long Island City Freight Yard (AOC1)	Information	128	No	0.40 mile	Filling station, solid waste management, and lumber yard	Utilized as part of a lumber yard	The site had a former gas station with 9 USTs, containing leaded gasoline and No. 2 fuel oil. Investigations conducted in the 1980s and 1990s detected VOCs and SVOCs in subsurface soils and hydrocarbons in groundwater. In the mid-1990s, all tanks, piping, and concrete associated with the service station were cleaned and removed. Groundwater at the site generally flows westerly toward the East River. Stormwater and wastewater discharges flow from the site into a combined sewer, which discharges to Newtown Creek. No records of surface water investigations or discharge permits were identified. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
LIRR Long Island City Freight Yard (AOC2)	Information	129	No	0.27 mile	Gasoline service station	Current site use appears to be a vacant lot	The site is currently a vacant lot covered mostly with vegetation. Investigations conducted in the 1980s and 1990s detected VOCs and SVOCs in subsurface soils and hydrocarbons in groundwater. In the mid-1990s, all tanks, piping, and concrete associated with the service station were cleaned and removed. Sampling conducted in 2007 indicated the site was no longer a source of COPCs to groundwater. Groundwater at the site generally flows toward the East River. Stormwater and wastewater discharges flow from the site into a combined sewer system, which discharges to Newtown Creek. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
Manhattan Poly Bag	Information	130	Yes	Adjacent	Asphalt production, oil company, auto parts store, and warehouse	Plastics, foil, and coated paper bags manufacturer and warehouse and distribution operations	No information on uplands characterization was identified in documents available for review. There are documented unlawful discharge to an on-site catch basin that discharges to the creek. There is historical presence of numerous large USTs, ASTs, and asphalt production kettles. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.

Table 6-3
Data Gaps

Site Name	Data Gap Type	DAR No.	Adjacent to Creek	Distance to Creek	Historical site use (i.e., industries)	Current site use (i.e., industry)	Rationale
Metro Terminal	Physical/ Information	52	Yes	Adjacent	Fuel storage and transfer facility	Petroleum bulk storage and distribution	The uplands property is not well characterized. Areas of oil soaked soil were documented, and groundwater sampling has reportedly occurred. However, no results were available for review. Records indicate a spill of No. 6 fuel oil occurred producing sheen on the creek. Stormwater directly discharges from the site through Outfall 001 to Newtown Creek. A SPDES permit for stormwater and hydrostatic test water discharge was issued to the site in 1990. DMR data prior to 2006 was not available for review. Further investigation is warranted to determine whether this is a source of significant COPC loading to the creek.
Morgan Oil Terminal, Brooklyn	Physical/ Information	60	Yes	Adjacent	Brick and lime storage, asphalt manufacturer, metal incinerator, coal distributor, salt distributor, sawmill, and oil manufacturer and distributor	Undergoing remediation for future redevelopment	Coal/petroleum products were loaded/unloaded from barges and stored on site. A number of petroleum spills affecting surface water, soil, and groundwater occurred on the property, and site investigations have been conducted. The details were not available for review. NAPL, No. 6 fuel oil, BTEX, and MTBE have been detected in groundwater at the site. A groundwater extraction/treatment exists on the property. Historical stormwater/wastewater was discharged to English Kills. In 1965, oil contaminated waters were noted discharging to English Kills. A SPDES permit exists for discharge of effluent from the oil-water separator to English Kills. The property is currently undergoing active remediation for potential future development. Further investigation is warranted to determine whether this is a source of significant COPC loading to the creek.
Motiva Brooklyn Terminal	Information	50	Yes	Adjacent	Receipt, storage, and transfer of petroleum products	Receipt, storage, and transfer of petroleum products	Numerous soil and groundwater investigations have identified NAPL and BTEX in the soil/groundwater of the site. Groundwater flows toward the creek. Stormwater/wastewater has directly discharged through 2 outfalls (Outfalls 001 and 002) and to a combined sewer, which may overflow to Newtown Creek. Spills to the land and from the barge to the creek are documented. Site remediation has included operation of a NAPL recovery system, but no investigation or operations reports were available. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
NYCON Supply Corporation	Information	58	Yes	Adjacent	Concrete manufacturer	Ready-mix concrete manufacturer	Petroleum USTs are located on site, and illicit discharges to the creek were recently cited. The uplands is not well characterized. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
NYCT - Fresh Pond Depot	Information	18	No	1.41 miles	Auto repairs	Bus depot and maintenance operations; waste handling	No information on uplands characterization or stormwater/wastewater discharged was identified in documents available for review. Groundwater flow is generally toward the creek. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
NYCT - Kisco Lot	Information	13	No	0.31 mile	Associated with tracks used by NYCT or MTA	Site is used for NYCT waste accumulation	No soil or groundwater investigations have been conducted at the site, no spills were reported, and no remedial activities were noted. No information on stormwater/wastewater infrastructure or discharges were noted. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
NYCT Crosstown Annex Facility	Information	20	Yes	Adjacent	Sugar refining; trolley car storage and washing facility; bus washing and painting facility	Potentially paint shop and road service operations	No information on uplands characterization was identified in documents available for review. A historical yard drainage system discharged to the creek. No discharge information is available, and the site is connected to combined sewer NC-023. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
NYSDOT BIN 1075910	Information	21	Yes	Adjacent	Supports a 250-foot section of the Kosciuszko Bridge	Supports a 250-foot section of the Kosciuszko Bridge	The site is just used for a bridge truss for the Kosciuszko Bridge since the 1930s. No upland investigation has been done. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.

Table 6-3
Data Gaps

Site Name	Data Gap Type	DAR No.	Adjacent to Creek	Distance to Creek	Historical site use (i.e., industries)	Current site use (i.e., industry)	Rationale
Outlet City	Information	132	No	0.35 mile	Disinfectant, soaps, deodorants, floor maintenance products, dermatitis controls, insecticides, paper towels, tamed iodine (R), detergents, germicides, and pharmaceuticals manufacturer	Offices and a warehouse for retail stores	NAPL has been identified on the site. Groundwater flow is towards the creek. Preferential pathways for groundwater may exist at the site. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
Pebble Lane Associates	Information	134	Yes	Adjacent	Recycling of clean fill material; maintenance and parking of trucks used for hauling petroleum products	Solid waste transfer facility; glass recycling; and maintenance and parking of petroleum hauling trucks	No information on uplands characterization was identified in documents available for review. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
Pinkas Fischer	Information	136	No	0.07 mile	Dry rendering and warehouse/storage	Parking lot	The site had a meat rendering operation that had illicit discharges to a private sewer line and from there to the creek until the late 1970s (starting period unknown). Research is needed to determine where the 15-inch private sewer line drained to the creek. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
Popular Hand Laundry	Information	38	No	0.10 mile	Skein dyeing, industrial dry cleaner, and laundry facility	Storage and restoration of antique furniture and artwork	The site is currently undergoing remediation under the VCP with NYSDEC. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
PV Knit Goods Processing	Information	137	No	1.49 miles	Metal novelties manufacturer, textile dyer, and finishing plant for cotton	Unknown use but building with paved lot on site currently	No uplands characterization information is available. The site is a former IDW permit holder and discharges to a combined sewer, which may overflow to Newtown Creek. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
Quanta	Physical/ Information	39	No	0.08 mile	Gasoline, kerosene, astral, distillate fuel oils; light and heavy fuel oils manufacturing; refine used crankcase oil and petroleum waste products; recycling, processing and storing used and unused oils, solvents, and miscellaneous waste materials; and remedial investigations and activities	Truck parking or storing tractor trailer trucks	The site has an easement to the creek across the RAD I site since at least the 1930s. The easement contained petroleum conveyance pipelines to transport products from the dock to the site. Tanks were historically present on site containing oil, acid, still bottoms, chemicals (including PCB oil), and oil and earth. The site discharged untreated stormwater and wastewater to the creek from the 1930s through the 1970s via an 8-inch-diameter pipe located in the easement. A number of investigations and remedial activities have been completed on the uplands portion of the property, with numerous detections noted in groundwater and upland soils. Further investigation is warranted to determine whether this is a source of significant COPC loading to the creek.

Table 6-3
Data Gaps

Site Name	Data Gap Type	DAR No.	Adjacent to Creek	Distance to Creek	Historical site use (i.e., industries)	Current site use (i.e., industry)	Rationale
Queens West (Hunters Point) Center Boulevard	Information	133	No	0.34 mile	Chemical company, asphalt company, varnish works, gum storage, barrel manufacturer, plumbing supply manufacturer, auto repair, and insecticide manufacturer	Paved road with underground utilities, a public park, a vacant lot, and a residential/ commercial building called the Avalon Riverview North Building	The site is located closer to the East River, and the combined sewer discharges to the East River. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
Queens West (Hunters Point) Parcel 11	Information	138	No	0.27 mile	Former freight yard	Residential and commercial buildings called Avalon Riverview and Riverview Gardens	The site is located closer to East River than Newtown Creek. Groundwater and stormwater/ wastewater pathways are to the East River. Further information needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
Remco Maintenance LLC	Information	19	No	0.44 mile	Truck and fire apparatus, hat, and gasoline meter manufacturer; newspaper distributor	Restoration and maintenance services for metals, marble, wood, and glass	No information found regarding upland site characterization. Site is connected to the creek via combined sewer which may overflow to Dutch Kills. Further information needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
Rencoa, Inc.	Information	139	No	0.01 mile	Tallow and grease manufacture, fat rendering, waste transfer station, and recyclables handling	Solid waste transfer station and recyclable handling and recovery	A total of seven petroleum USTs and four petroleum ASTs have been located on the site, with the four ASTs still in service. In 2005, a tank failure reportedly resulted in a diesel release. There is no groundwater or soil quality data available for the site. A SPDES permit is in place for the discharge of treated industrial stormwater runoff (no permit or data were found in available records). Historically, industrial wastewater and stormwater were discharged directly to the creek. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
Review Avenue Development I	Physical/ Information	41	Yes	Adjacent	Brewery, animal rendering (fat melters, glue makers, bone buyers, hide dealers, poultry feed), fertilizer manufacturers, oil refining, coal terminal, transfer station for construction and demolition materials, heavy equipment storage, zinc alloy and metal manufacturing, asphalt recycling, trucking, and vehicle fueling and maintenance	Rental equipment for film and television industry and asphalt recycling/transfer station	USTs and ASTs have historically been on site containing oils, solvents, gasoline, and diesel fuels. Historical discharges of process water, wastewater, and sewage from the site to the creek have been documented. Investigations and limited remedial activities have occurred at the site. Numerous COPCs were detected in groundwater and upland soils. Further investigation is warranted to determine whether this is a source of significant COPC loading to the creek.
Rhoda Uretsky Trust	Information	14	No	0.22 mile	Scrap metal smelting/recycling and restaurant equipment repair	Restaurant equipment repair	Soil and groundwater at the site are not well characterized. Cooling water discharge (including unknown chemicals) to the creek was cited in a 1959 document. There is not enough information to determine impacts to Newtown Creek. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.

Table 6-3
Data Gaps

Site Name	Data Gap Type	DAR No.	Adjacent to Creek	Distance to Creek	Historical site use (i.e., industries)	Current site use (i.e., industry)	Rationale
Roehr Chemicals, Inc.	Information	42	No	0.23 mile	Stone cutting and granite polishing; dry cleaning; precious metal works; pharmaceutical manufacturing	Packaged food warehouse	Numerous soil and groundwater investigations were performed at the site, and remedial measures were implemented to address contaminants. Wastewater historically discharged to a combined sewer system, with overflow to Newtown Creek. A ROD concluded no further actions were needed at the site. Groundwater contamination has been detected in down gradient wells, and groundwater flows toward the creek. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
S&L Metal Products Corp.	Information	142	No	0.50 mile	Precision machining operations; metal polishing and finishing; and electroplating; hydraulic/ pneumatic assemblies	Manufacturer of metal products; windows and parts dealer; cleaning services; mechanical contractor	No information on uplands characterization was identified in documents available for review. Facility discharged to a combined sewer, which may overflow to Maspeth Creek. Two IDW permits have been obtained for the site, and multiple violations were issued for wastewater discharge exceedances to the combined sewer. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
Silverman Gorf, Inc.	Information	141	No	1.63 miles	Active metal plater	Metal plater	No information on uplands characterization, stormwater/wastewater, or combined sewer discharges to the creek was identified in documents available for review. Regional groundwater flows west toward the East River. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
Soap Manufacturer and Lacquer Storage	Information	104	No	0.28 mile	Lacquer storage, soap powder manufacturer, and cleaning products manufacturer	Unknown	The NYSDEC Meeker Avenue Plume Study concluded that the site may be a potential source of TCE and PCE. No upland characterization was available in records, and no information on site drainage/discharges was available for review. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
STAR Corrugated Box Co.	Information	143	No	0.35 mile	Manufacturer of corrugated boxes and displays	Manufacturer of corrugated boxes and displays	NAPL and VOCs/SVOCs have been in groundwater, and uplands remediation is either complete or ongoing. Historical features relating to collection and discharges of groundwater and stormwater are not well understood. There is insufficient data available to determine site impacts to the creek through groundwater or stormwater/wastewater pathways. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
Structural Processing Corp.	Information	144	No	0.66 mile	Unknown	Metal finisher specializing in anodizing, Kynar painting, and powder coat finishing	There have been no IDW permits since 1993. No information on uplands characterization or site discharges to the creek were identified in documents available for review. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
TBTA Queens Midtown Tunnel	Information	15	No	0.10 mile	Iron works, sugar refinery, and building materials storage facility	Entrance and toll booth for the Queens Midtown Tunnel of the Long Island Expressway	There are USTs and ASTs at the site, and the site is a RCRA waste generator. Documented spills at the site mostly involve equipment or tank failures. The site discharges to a combined sewer, which may overflow to Newtown Creek. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.

Table 6-3
Data Gaps

Site Name	Data Gap Type	DAR No.	Adjacent to Creek	Distance to Creek	Historical site use (i.e., industries)	Current site use (i.e., industry)	Rationale
Technical Metal Finishers	Information	43	No	0.45 mile	Dairy products; electroplating, metal finishing, nondestructive testing, and painting until a 1982 fire uncovered significant environmental concerns at facility	Facility demolished; current use unknown; possibly used as storage/parking lot	Reviewed records indicate soil removal occurred at the site during demolition and waste removal activities, but no site characterization information was found in records. The site discharges to the head of English Kills. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
Tru-Tone Metal Products	Information	146	No	0.48 mile	Aluminum anodization and painting	Active aluminum anodization and painting	Limited characterization of upland conditions exist. Site discharges to a combined sewer, which may overflow to Maspeth Creek. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
United Envelope	Information	17	No	0.37 mile	Filling station, auto repair/sales, and parts storage	Envelope printing and manufacturing	There is no groundwater or soil quality information available for the site. A tank containing No. 2 fuel oil was present on site. Stormwater and wastewater flow into a combined sewer system, which is connected to Dutch Kills. Reviewed records did not indicate current or historical site spills. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
Waste Management of NY - 123 Varick Avenue	Information	46	Yes	Adjacent	Manufactured asphalt, steel pipe fabrication, waste management and recycling, construction and demolition debris, and putrescible waste processing	Construction and demolition (C&D) debris transfer station	The site currently and historically has/had ASTs. From at least 2001 to 2009, treated stormwater from the building roof and wastewater from construction and demolition operations discharged into English Kills through Outfalls 001 and 002. Outfall 002 was reportedly permanently sealed and routed to a municipal system, which would discharge to English Kills during CSO events. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
Wilco Finishing Corp.	Information	149	No	0.51 mile	Garage, metal finishing, and electroplating	Electroplating	No uplands characterization information is available. The site is a former IDW permit holder, and the site discharges to a combined sewer, which may overflow to English Kills. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.
Wing Gong Laundry	Information	150	No	0.22 mile	Former dry cleaner; former tannery	Industrial laundry	The site is located closer to the East River, so stormwater/wastewater discharges are to the East River. Groundwater flow has potential to reach the creek, but no upland soils or groundwater data exist. Further information is needed to determine site conditions and potential creek impacts from complete and potentially complete pathways.

Notes:
AOC – Agreed Order on Consent
AS – air sparging
AST – aboveground storage tank
BTEX – benzene, toluene, ethylbenzene, and xylene
COPC – constituent of potential concern
CSO – combined sewer overflow
DMR – discharge monitoring report
EDR – Environmental Data Resources, Inc.
IWD – industrial wastewater discharge
LNAPL – light nonaqueous phase liquid
LQG – large quantity generator
MTBE – methyl tertiary butyl ether
NAPL – nonaqueous phase liquid
NFA – no further action
NYCT – New York City Transit
NYSDEC – New York State Department of Environmental Conservation
OWS – oil-water separator
PAH – polycyclic aromatic hydrocarbon
PCB – polychlorinated biphenyl
PCE – tetrachloroethylene
RAD – Review Avenue Development
RCRA – Resource Conservation and Recovery Act
RI – Remedial Investigation
ROD – Record of Decision
SPDES – State Pollutant Discharge Elimination System
SVE – soil vapor extraction
SVOC – semi-volatile organic compound
TCE – trichloroethylene
TCLP – toxicity characteristic leaching procedure
TPH – total petroleum hydrocarbon
USEPA – U.S. Environmental Protection Agency
UST – underground storage tank
VCP – Voluntary Cleanup Program
VOC – volatile organic compound
WWT – wastewater treatment

FIGURES

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ANCHOR QEA

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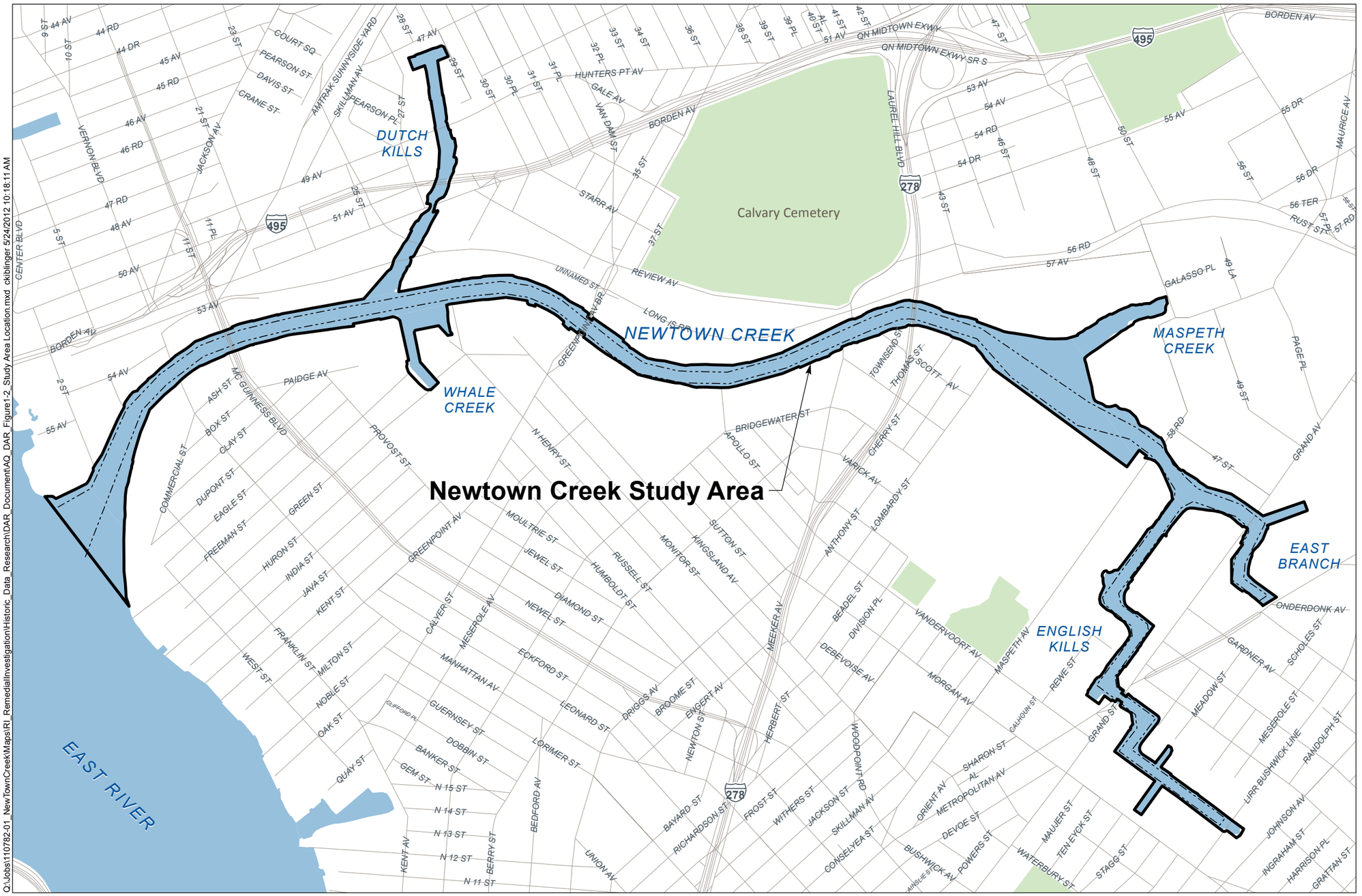
Figure 1-1
Location Map
Data Applicability Report
Newtown Creek RI/FS



Newtown Creek Study Area
Waterbody
Open Space

Note:
Base data: NYCDOITT

0 500 1,000 1,500
Feet

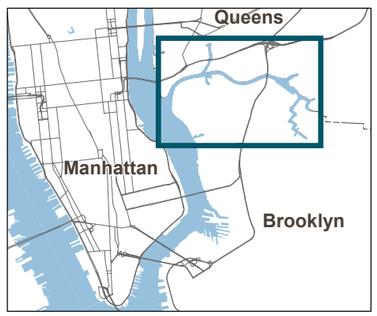


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Figure 1-2
Study Area Location
Data Applicability Report
Newtown Creek RI/FS

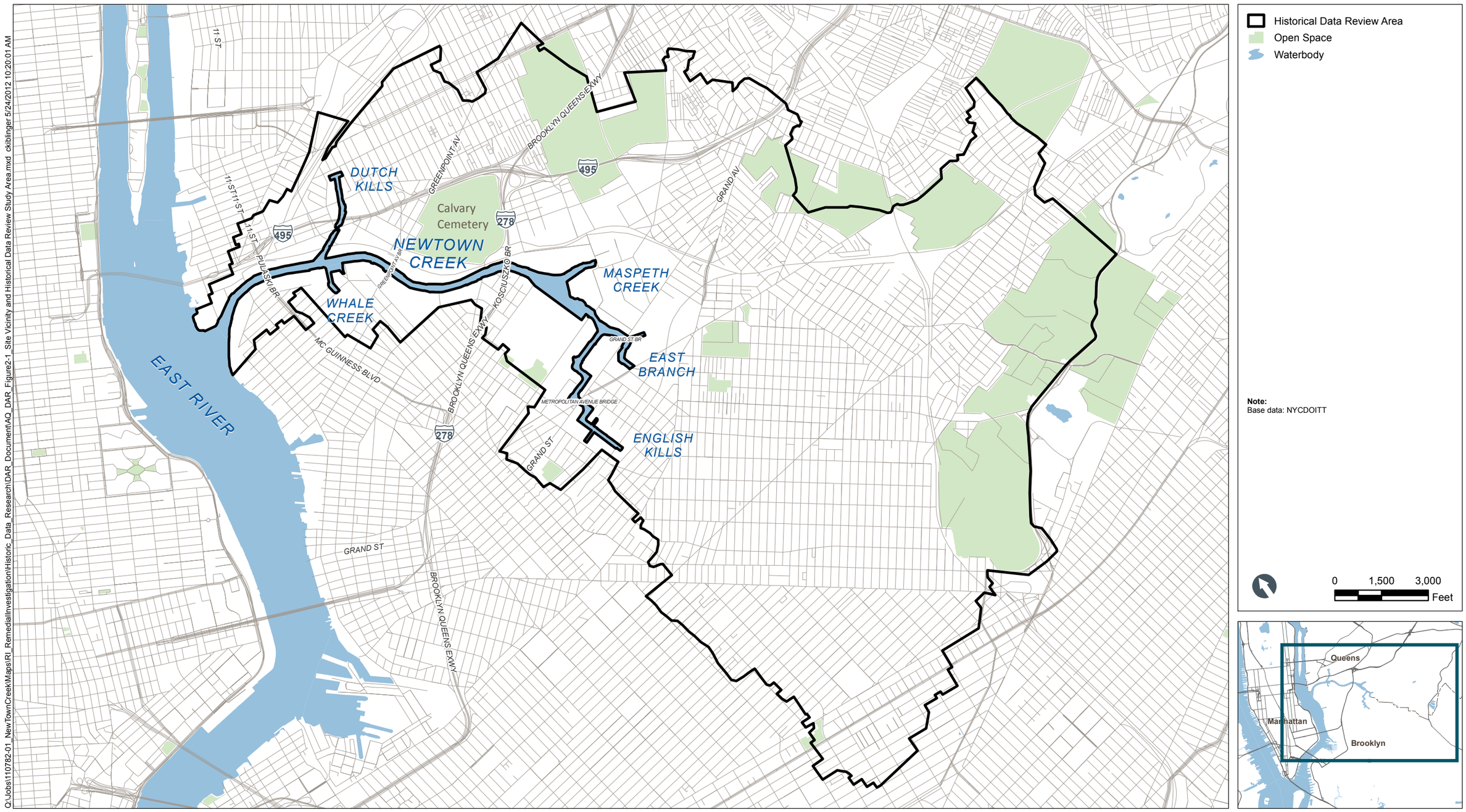

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Figure 2-1
Site Vicinity and Historical Data Review Study Area
Data Applicability Report
Newtown Creek RI/FS

Source: Hassler 1844

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Figure 4-1
Historical Newtown Creek (1844)
Data Applicability Report
Newtown Creek RI/FS

Q:\Jobs\110782-01_NewTownCreek\Maps\RI_RemedialInvestigation\Historic_Data_Research\DAR_Document\AQ_DAR_Figure4-2_Historical Newtown Creek Configuration Over Time.mxd ckiblinger 5/24/2012 10:30:45 AM

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Figure 4-2a
Historical Newtown Creek Configuration Over Time (1891)
Data Applicability Report
Newtown Creek RI/FS

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Figure 4-2b
Historical Newtown Creek Configuration Over Time (1949)
Data Applicability Report
Newtown Creek RI/FS

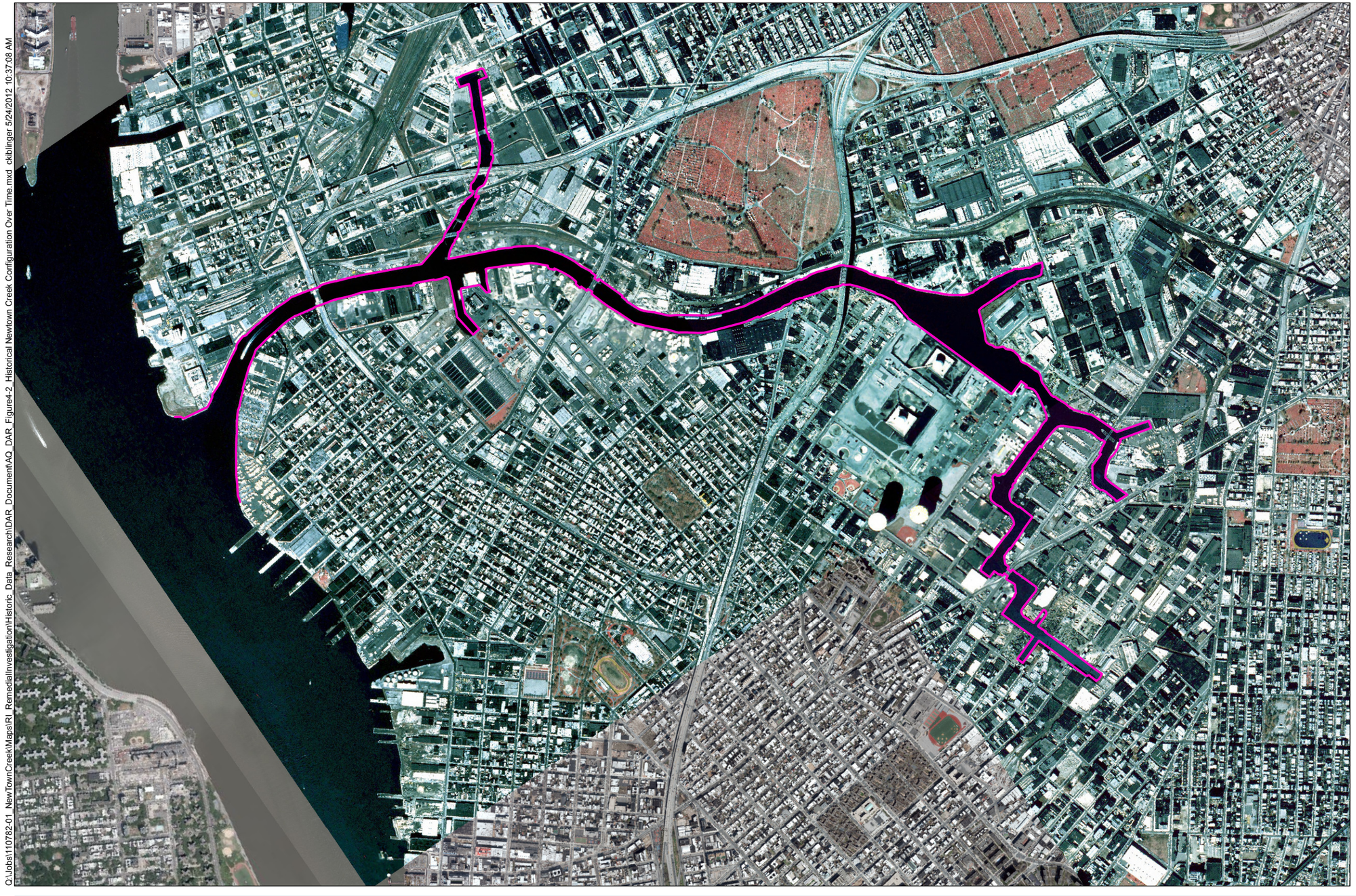

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Figure 4-2c
Historical Newtown Creek Configuration Over Time (1994)
Data Applicability Report
Newtown Creek RI/FS

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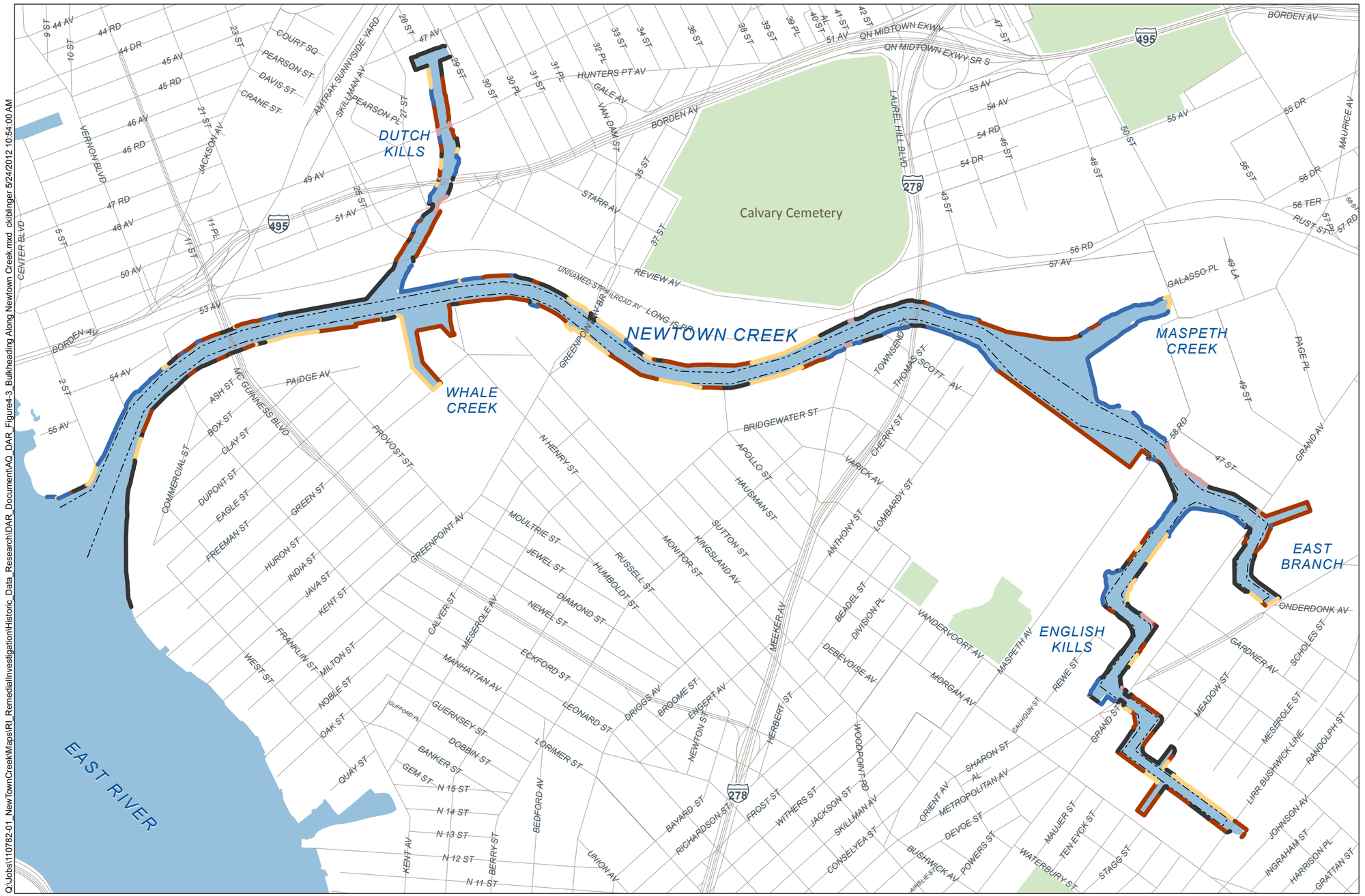
Figure 4-2d
Historical Newtown Creek Configuration Over Time (2010)
Data Applicability Report
Newtown Creek RI/FS



Waterbody
Open Space

Bulkhead Material
- Concrete
- Metal
- Riprap
- Rock
- Wood

Note:
Data obtained from Anchor QEA Shoreline Assessment (November 2011).

0 500 1,000 1,500 Feet

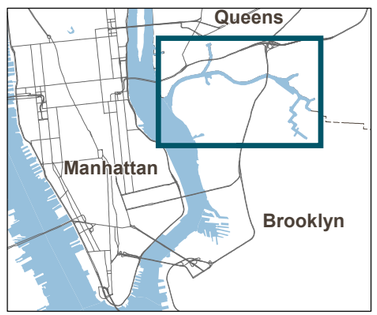


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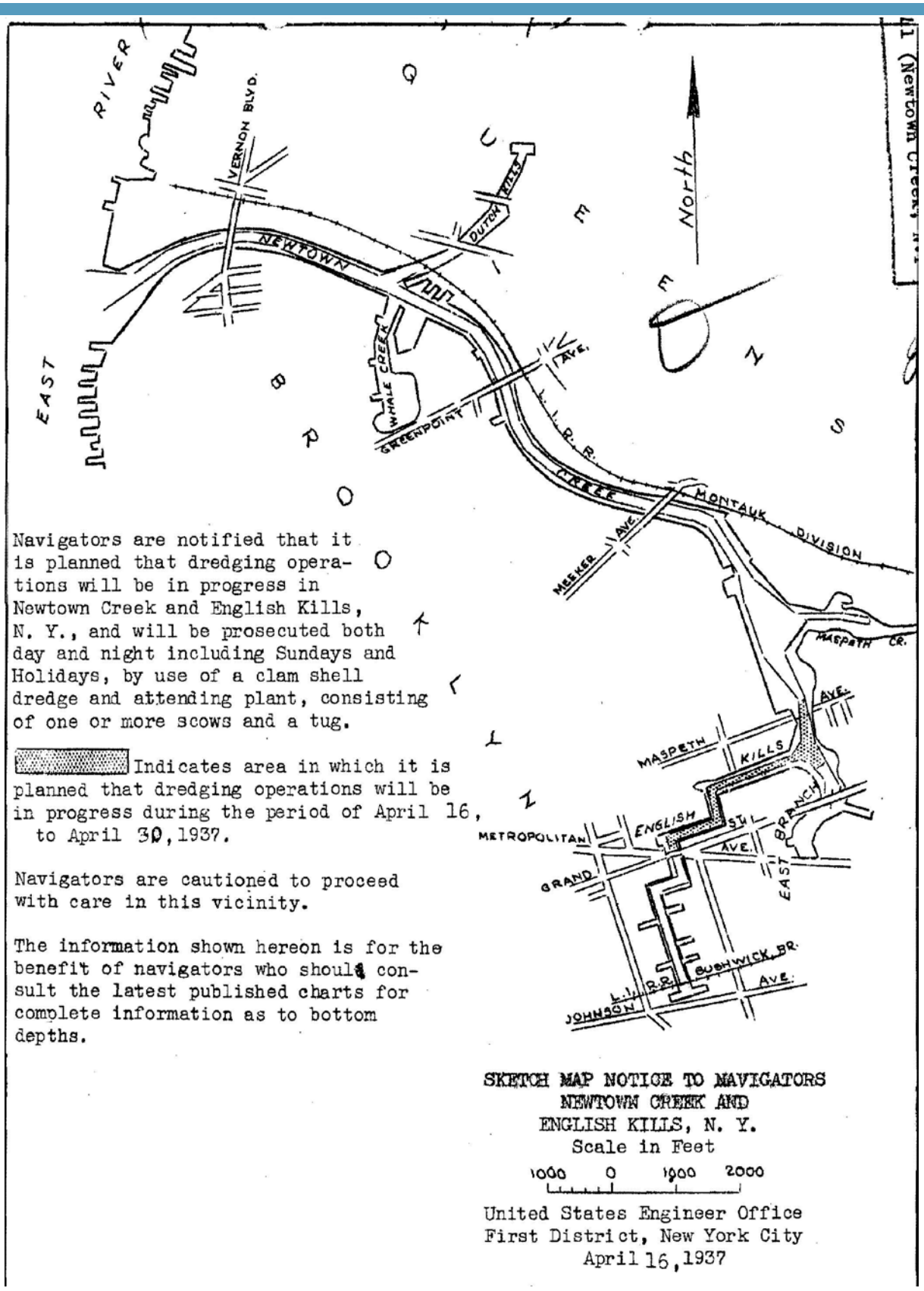
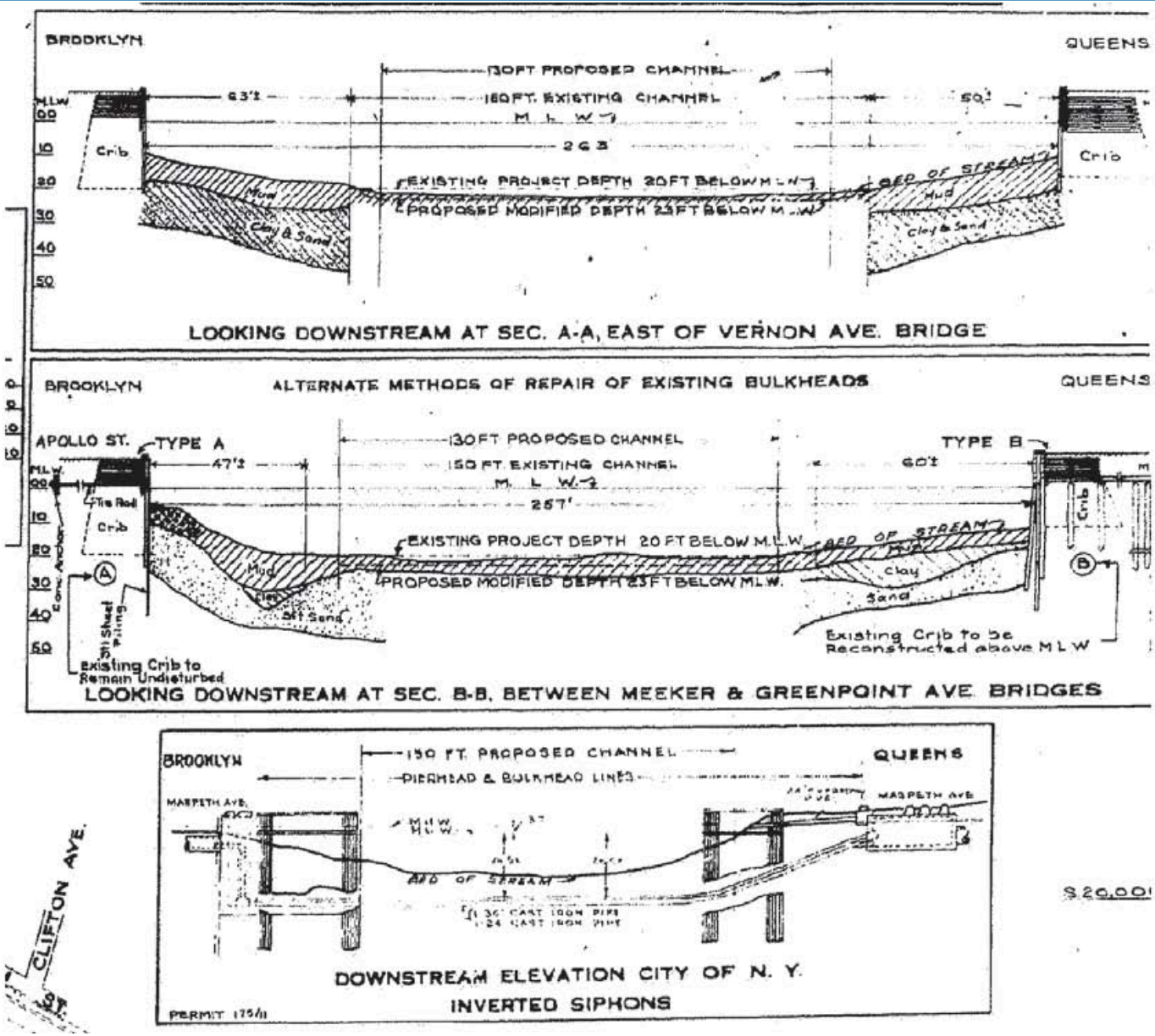
Figure 4-3
Bulkheading Along Newtown Creek
Data Applicability Report
Newtown Creek RI/FS



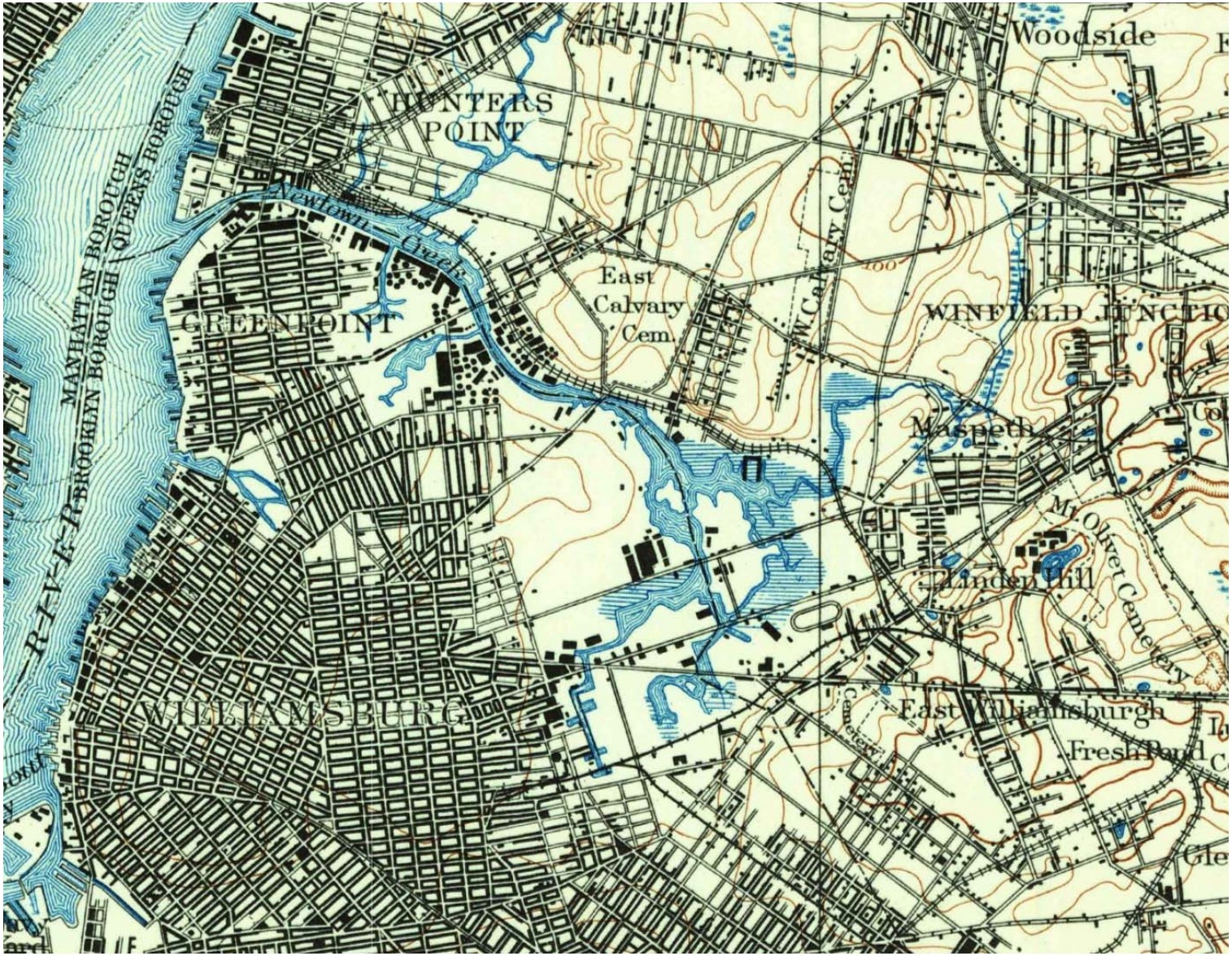
Source: Office of the Chief of Engineers 1937

Figure 4-4
General Map of Areas to be Dredged in 1936 - 1937
Data Applicability Report
Newtown Creek RI/FS



Source: War Department 1930b

Figure 4-5
Representative Bulkhead Cross-Sections
Data Applicability Report
Newtown Creek RI/FS



Scale 1:62,500; Source: USGS 1898

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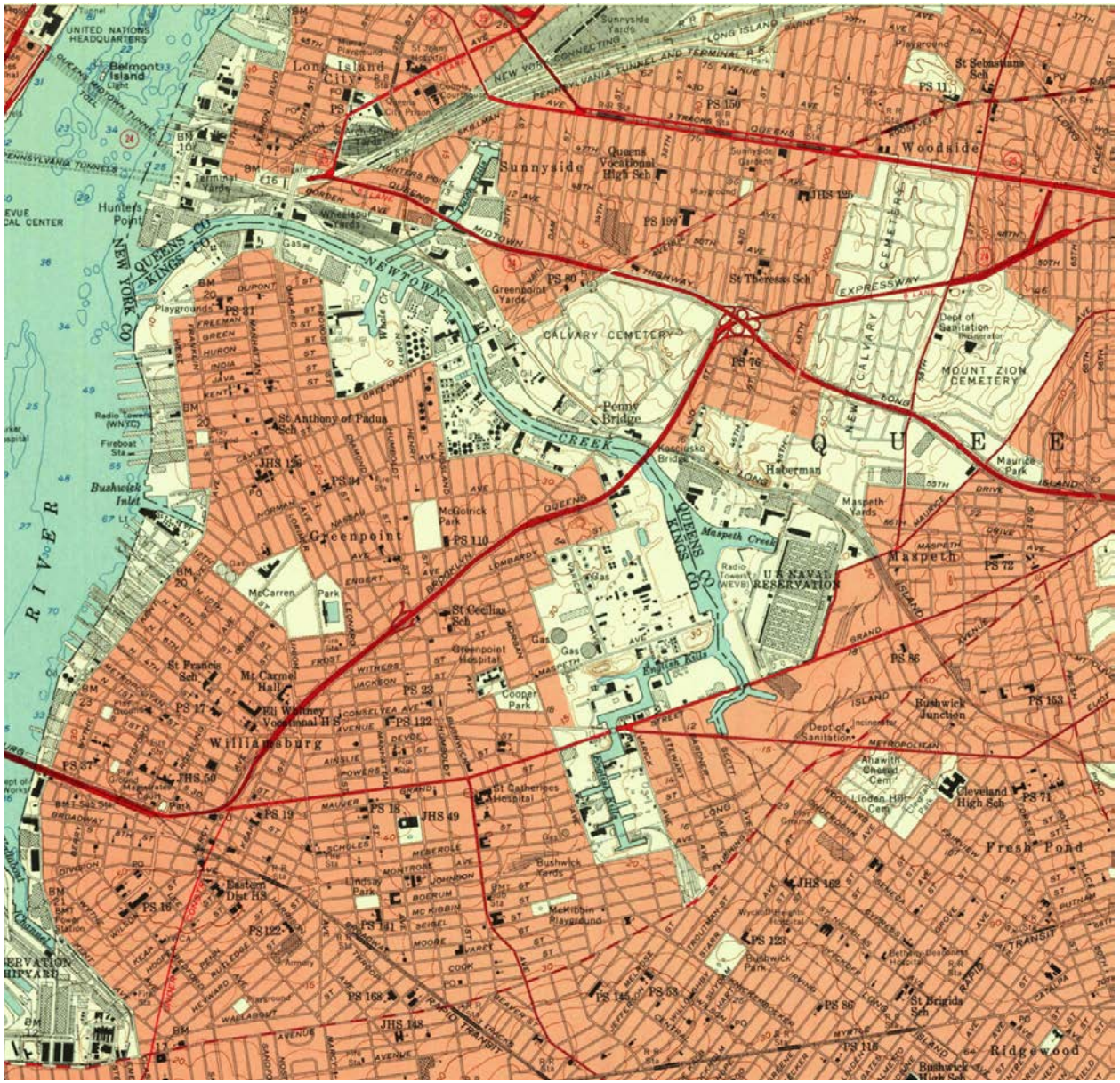
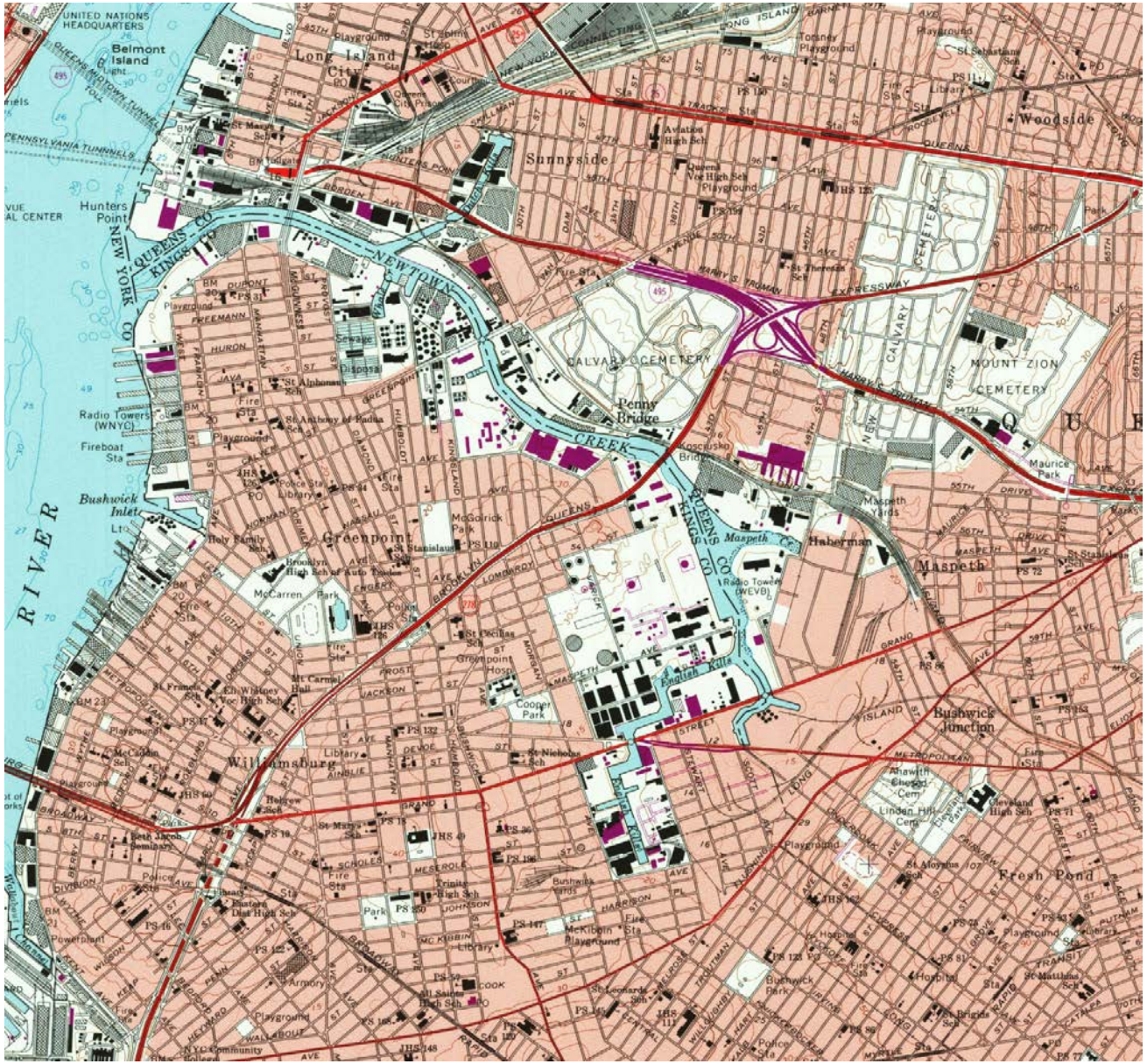
Figure 4-6a
Historical Fill Development (1898)
Data Applicability Report
Newtown Creek RI/FS

Scale 1:24,000; Source: USGS 1947
Note:
Arrow shows approximate location of Long Island Rail Road docking slips on current Hugo Neu property.

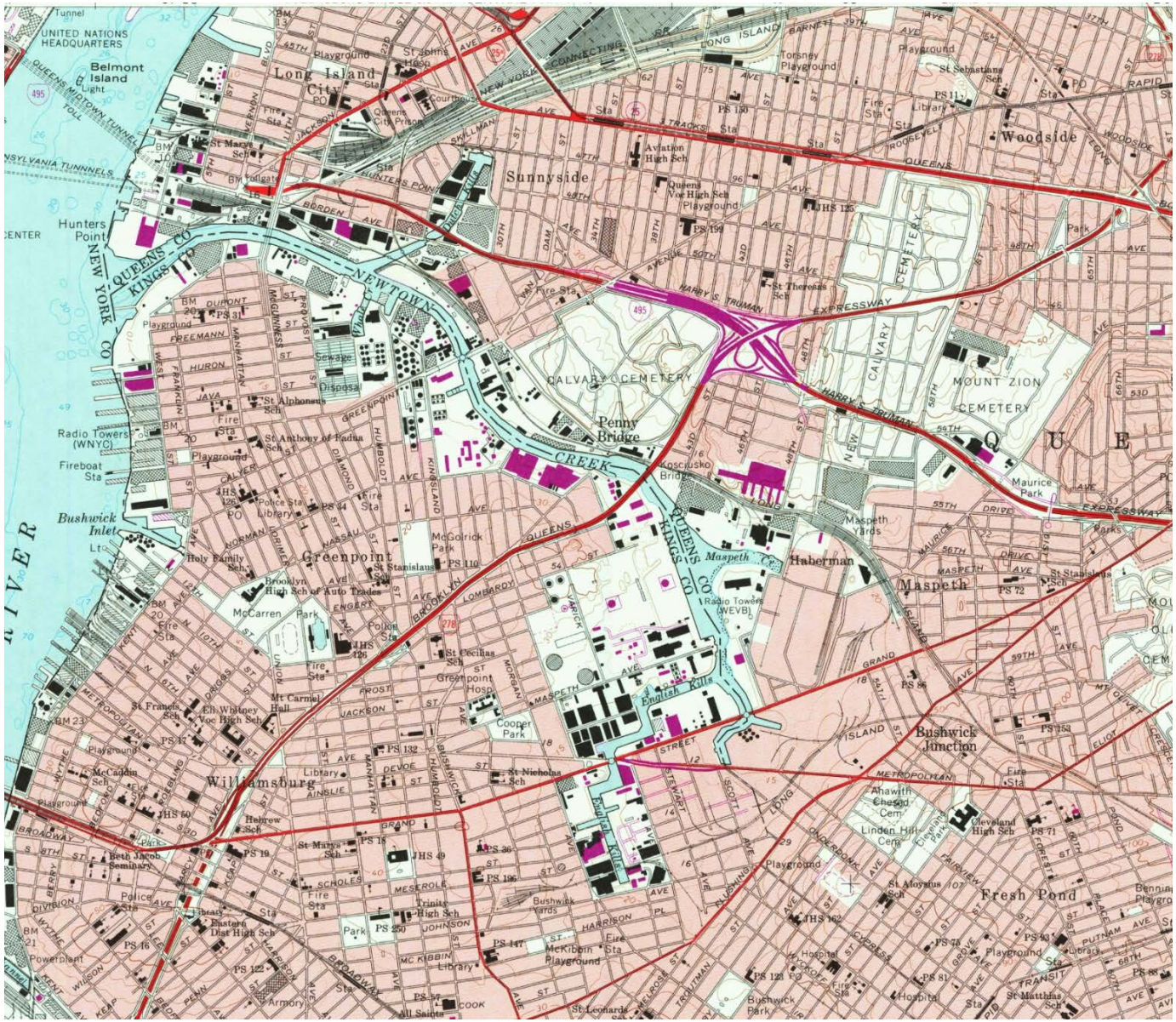


Scale 1:24,000; Source: USGS 1956

Figure 4-6c
Historical Fill Development (1956)
Data Applicability Report
Newtown Creek RI/FS



Scale 1:24,000; Source: USGS 1967



Scale 1:24,000; Source: USGS 1979

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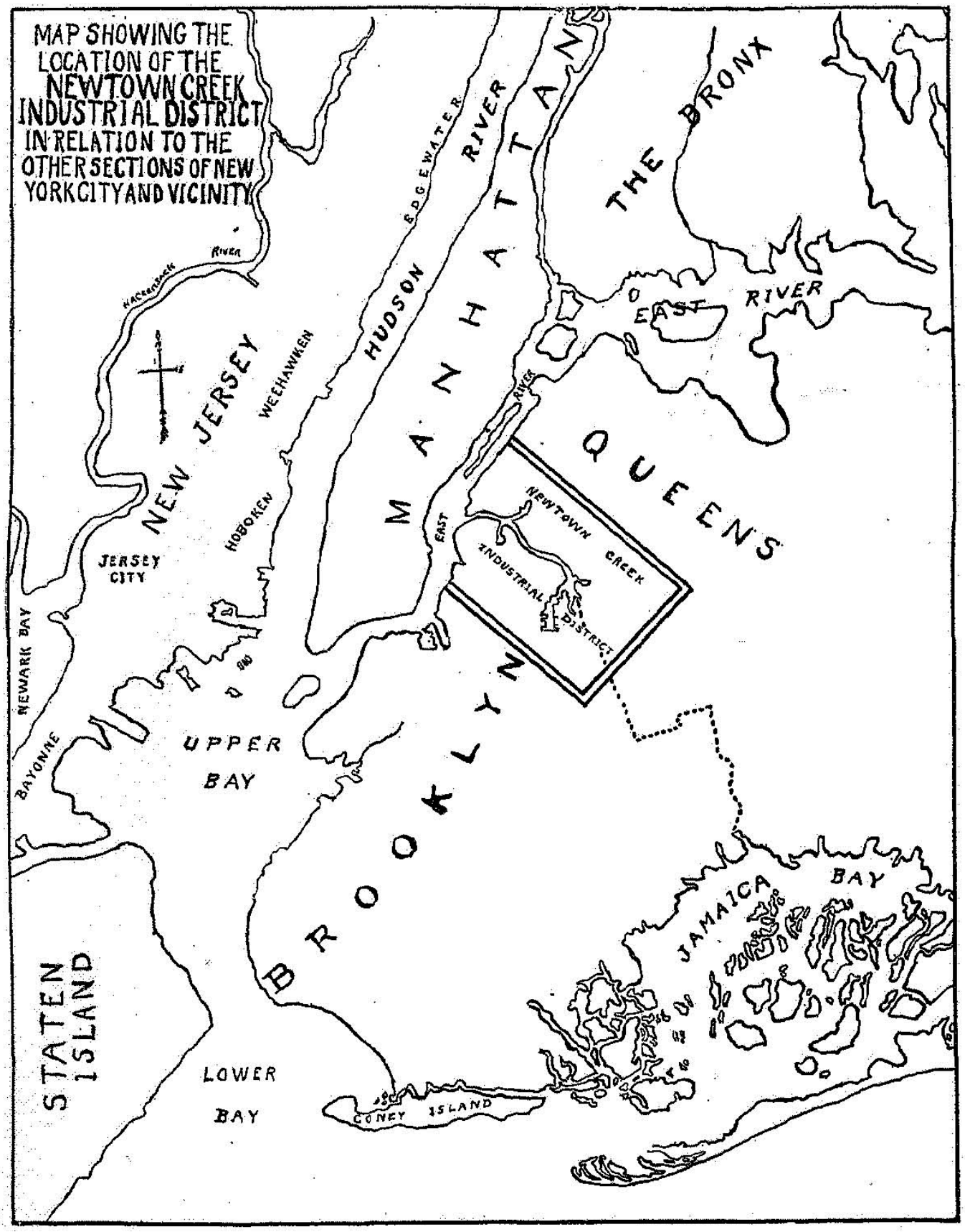
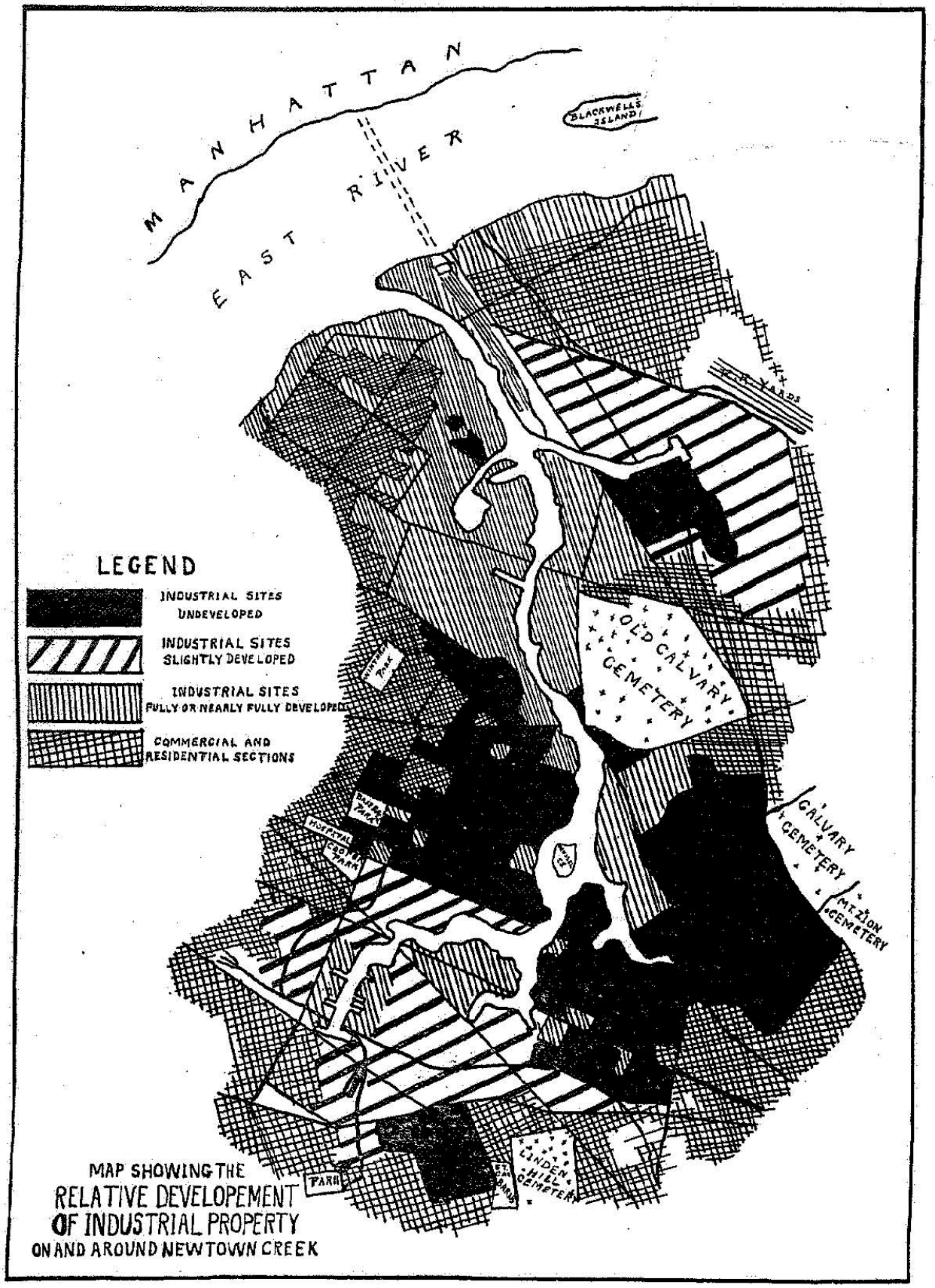
Figure 4-6e
Historical Fill Development (Revised 1979)
Data Applicability Report
Newtown Creek RI/FS



Source: MANY 1921



Source: MANY 1921

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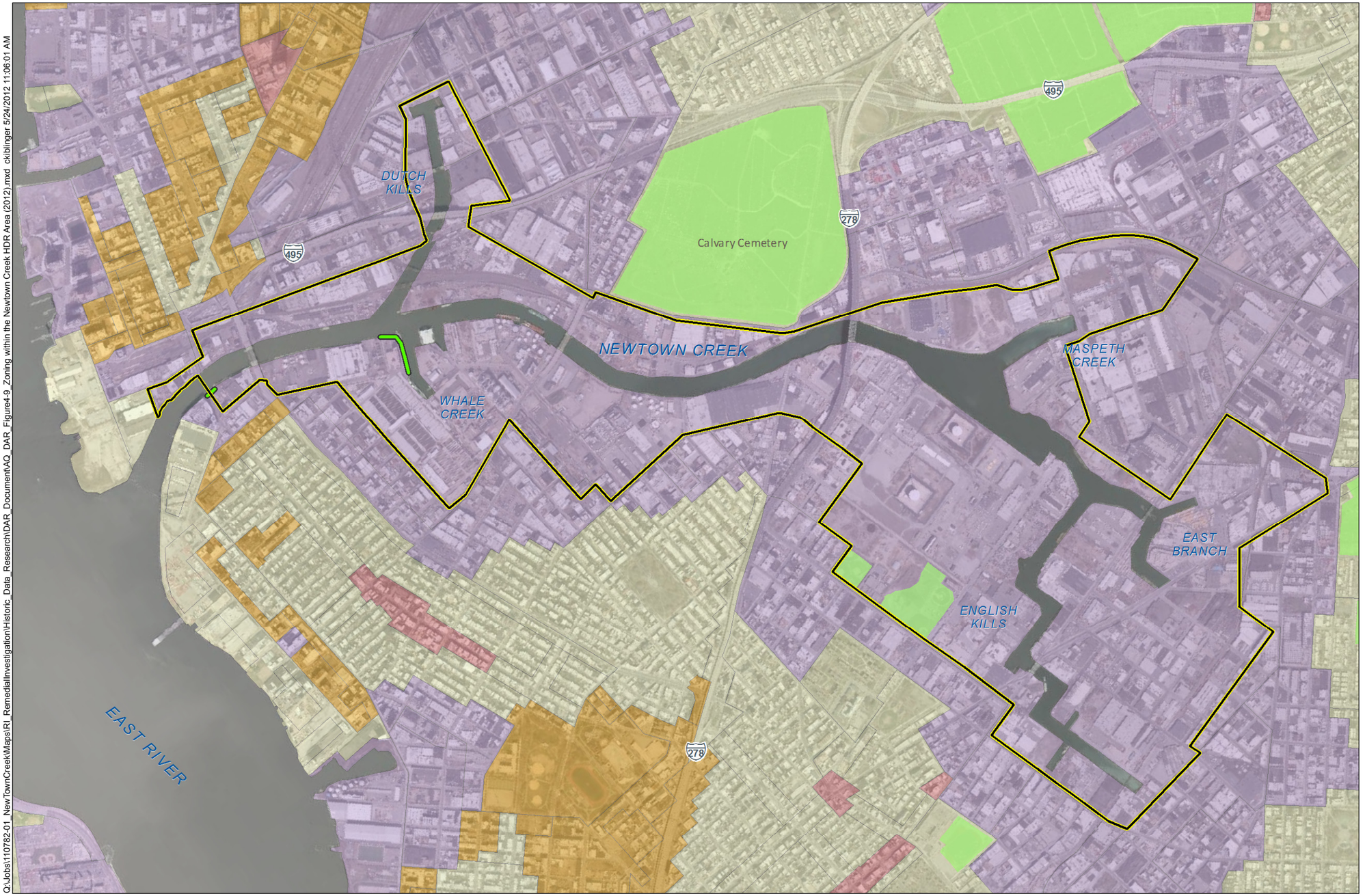
Figure 4-8
Historical Land Use (1921)
Data Applicability Report
Newtown Creek RI/FS



Public Access Areas

Significant Maritime Industrial Area, M3-1 (Manufacturing) Zoning District

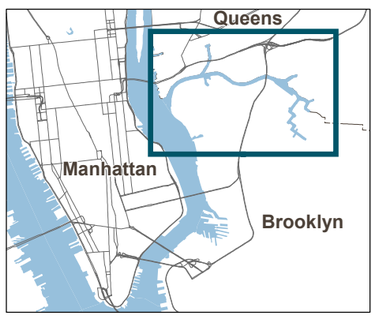
Open Space

Zoning

- Commercial
- Manufacturing
- Manufacturing/Residential
- Residential

Notes:
1. Zoning data obtained from New York City Department of Information Technology & Telecommunications (NYCDOITT).
2. Aerial photos: 2010, NYCDOITT

0 500 1,000 1,500 Feet



Q:\Jobs\110782-01_NewTownCreek\Maps\RI_RemedialInvestigation\Historic_Data_Research\DAR_Document\AQ_DAR_Figure4-9_Zoning within the Newtown Creek HDR Area (2012).mxd ckiblinger 5/24/2012 11:06:01 AM

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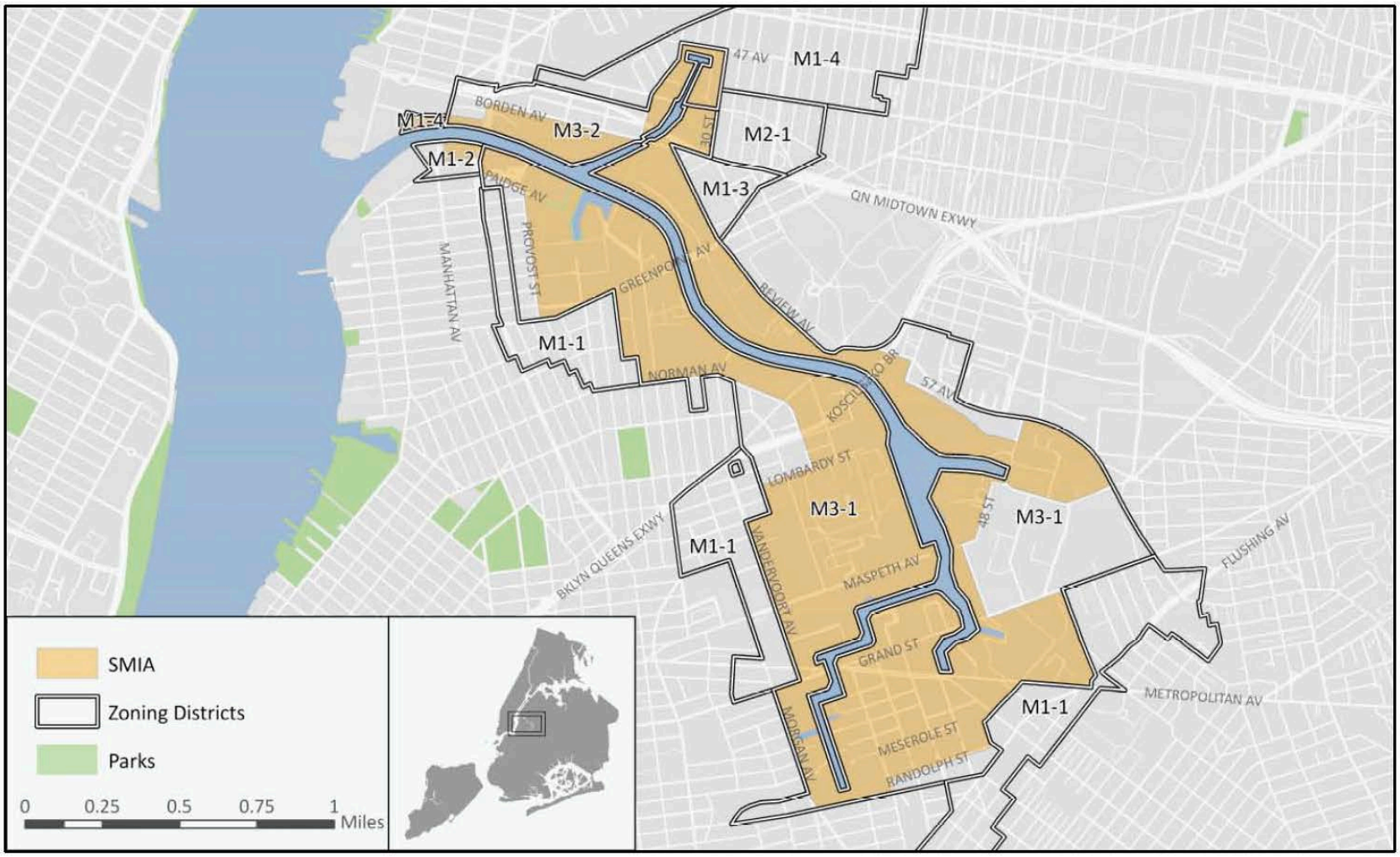
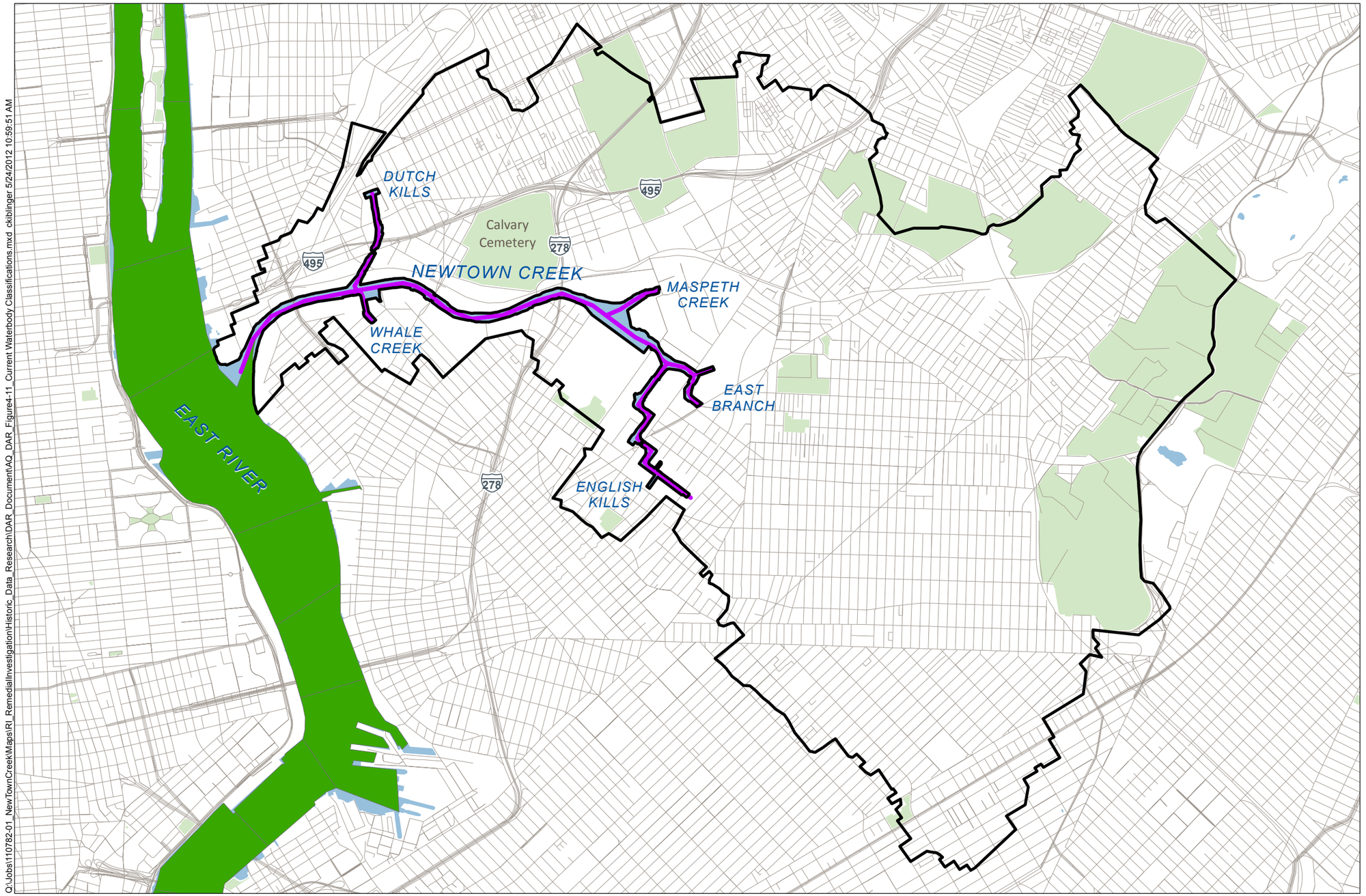
Figure 4-9
Zoning within the Newtown Creek HDR Area (2012)
Data Applicability Report
Newtown Creek RI/FS



Source: NYC 2011
Note:
SMIA – Significant Maritime and Industrial Area 2011



Q:\Jobs\110782-01_NewTownCreek\Maps\RI_RemedialInvestigation\Historic_Data_Research\DAR_Document\AQ_DAR_Figure4-11_Current Waterbody Classifications.mxd ckiblinger 5/24/2012 10:59:51 AM

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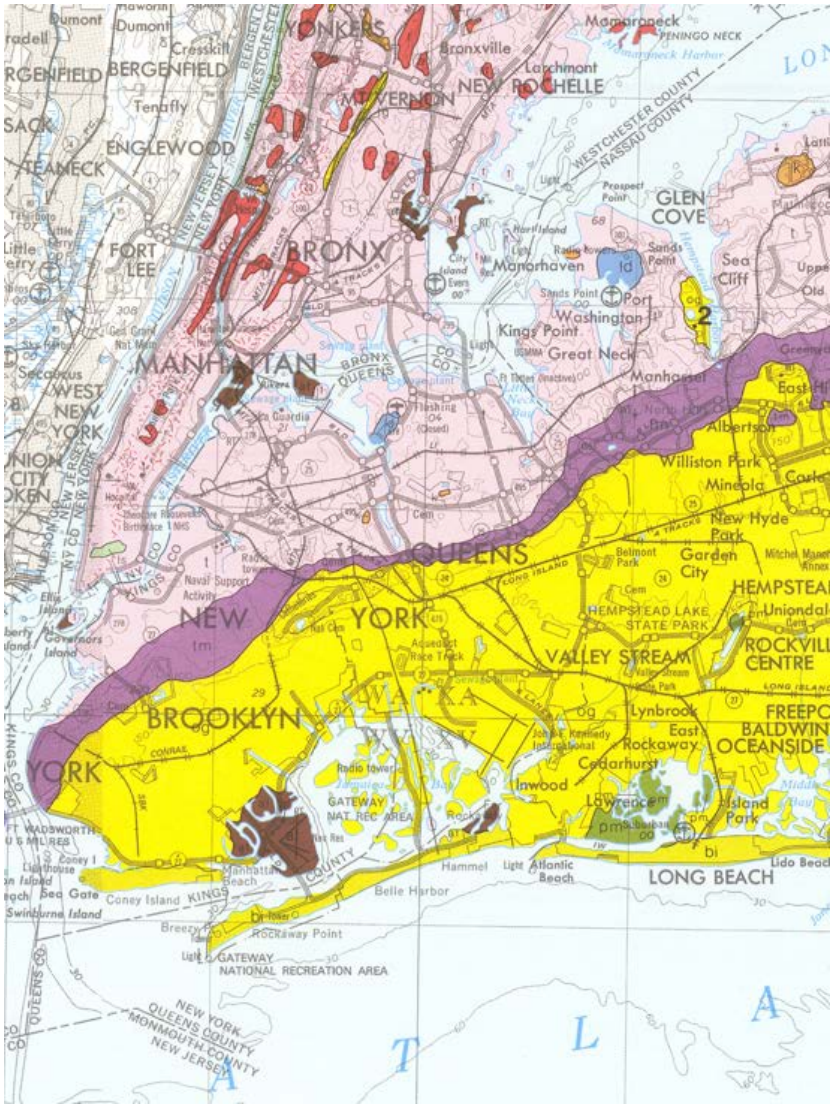
Figure 4-11
Current Waterbody Classifications
Data Applicability Report
Newtown Creek RI/FS

System	Series	Geologic unit		Hydrogeologic unit	Range of thickness, in feet	Range of altitude of upper surface, in feet above or below sea level
Quaternary	Holocene	Shore, beach salt-marsh deposits, and alluvium				
	Pleistocene	Wisconsin glaciation (Harbor Hill, interstadial marine, and Ronkonkoma Drift)	Till (ground and terminal moraine)	Upper glacial aquifer	0 to 300	Land surface
			Outwash			
			"20-foot" clay (marine)			
			unconformity?			
		Sangamon interglaciation	Gardiners Clay (marine)	Gardiners Clay	0 to 150	–40 to –200
			unconformity?			
		Pre-Wisconsin glaciation (Illinoian?)	Jameco Gravel	Jameco aquifer	0 to 200	–90 to –240
			unconformity?			
Cretaceous	Upper Cretaceous	Matawan Group–Magothy Formation (undifferentiated)		Magothy aquifer	0 to 500	40 to –400
			unconformity?			
		Raritan Formation	Clay member	Raritan confining unit	0 to 200	30 to –650
			Lloyd sand member	Lloyd aquifer	0 to 300	–90 to –825
			unconformity?			
Precambrian		Crystalline bedrock		Bedrock	—	15 to –1,100

Source: Buxton and Shernoff 1999

Figure 4-12
General Geologic and Hydrogeologic Units of Western Long Island, New York
Data Applicability Report
Newtown Creek RI/FS



al — **Recent deposits**
Generally confined to floodplains within a valley, oxidized, non-calcareous, fine sand to gravel, in larger valleys may be overlain by silt, subject to frequent flooding, thickness 1–10 meters.

alf — **Alluvial fan**
Fan shaped accumulations, poorly stratified silt, sand and boulders, at the foot of steep slopes, generally permeable.

b — **Beach**
Sand and gravel deposit at marine shoreline, thickness variable.

bi — **Barrier island**
Sand and gravel deposit as barrier island, south shore of Long Island, may have associated dunes, thickness variable.

pm — **Swamp deposits**
Peat-muck, organic silt and sand in poorly drained areas, un-oxidized, may be overlying marl and lake silts, potential land instability, thickness generally 2-20 meters.

id — **Lacustrine delta**
Coarse to fine gravel and sand, stratified, generally well sorted, deposited at a lake shoreline, thickness variable (3-15 meters).

lsc — **Lacustrine silt and clay**
Generally laminated silt and clay, deposited in proglacial lakes, generally calcareous, potential land instability, thickness variable (up to 100 meters).

ls — **Lacustrine sand**
Sand deposits associated with large bodies of water, generally a near-shore deposit or near a sand source, well sorted, stratified, generally quartz sand, thickness variable (2-20 meters).

og — **Outwash sand and gravel**
Coarse to fine gravel with sand, proglacial fluvial deposition, well rounded and stratified, generally finer texture away from ice border, thickness variable (2-20 meters).

fg — **Fluvial sand and gravel**
Deposits of sand and gravel, occasional laterally continuous lenses of silt, deposition farther from glacier, age uncertain.

k — **Kame deposits**
Includes kames, eskers, kame terraces, kame deltas, coarse to fine gravel and/or sand, deposition adjacent to ice, lateral variability in sorting, coarseness and thickness, locally firmly cemented with calcareous cement, thickness variable (10-30 meters).

km — **Kame moraine**
Variable texture (size and sorting) from boulders to sand, deposition at an ice margin during deglaciation, positive constructional relief, locally cemented with calcareous cement, thickness variable (10-30 meters).

tm — **Till moraine**
More variably sorted than till, generally more permeable than till, deposition adjacent to ice, more variably drained, may include ablation till, thickness variable (10-30 meters).

t — **Till**
Variable texture (e.g. clay, silt-clay, boulder clay), usually poorly sorted diamict, deposition beneath glacier ice, relatively impermeable (loamy matrix), variable clast content — ranging from abundant well-rounded diverse lithologies in valley tills to relatively angular, more limited lithologies in upland tills, tends to be sandy in areas underlain by gneiss or sandstone, potential land instability on steep slopes, thickness variable (1-50 meters).

af — **Artificial fill**

r — **Bedrock**
Exposed or generally within 1 meter of surface.

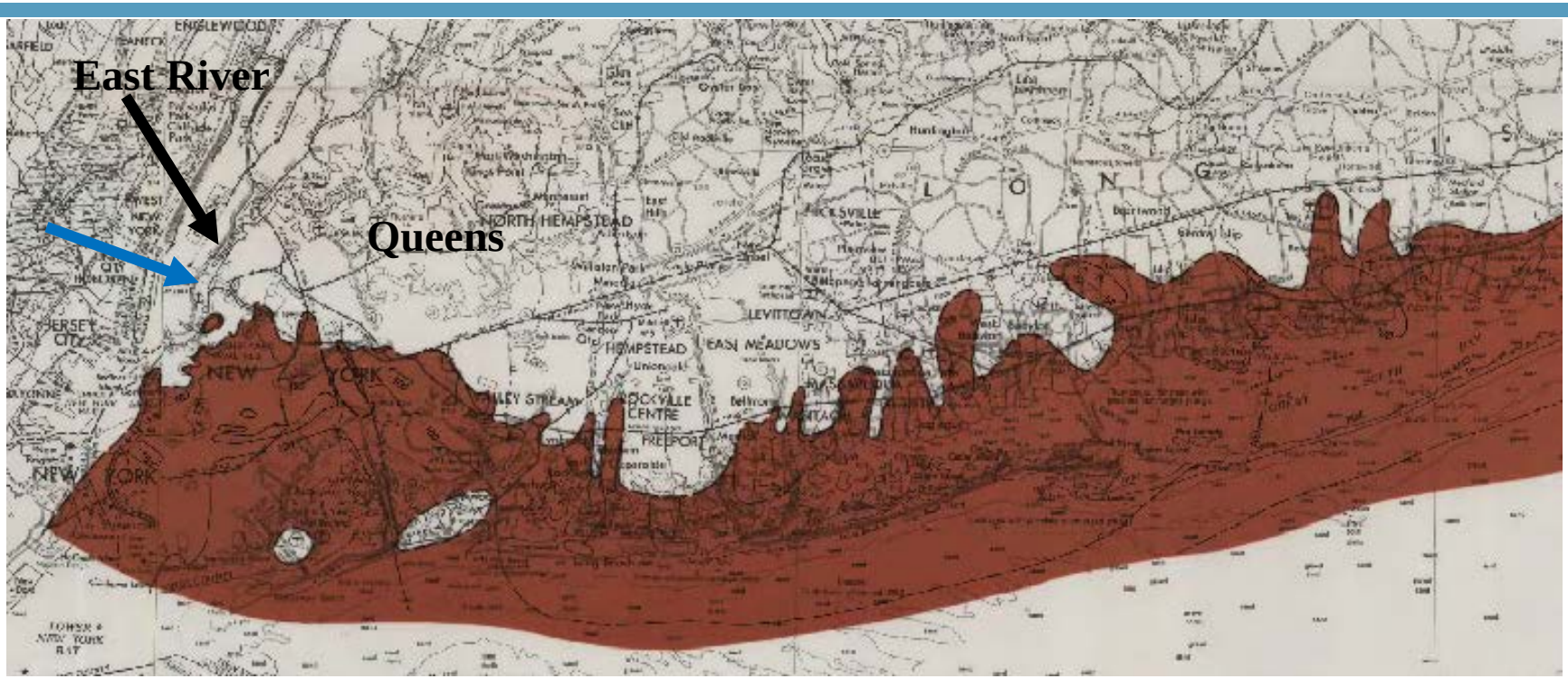
Bedrock stipple overprint
Bedrock may be within 1-3 meters of surface, may sporadically crop out, variable mantle of rock debris and glacial till.

MAP SYMBOLS

Contact

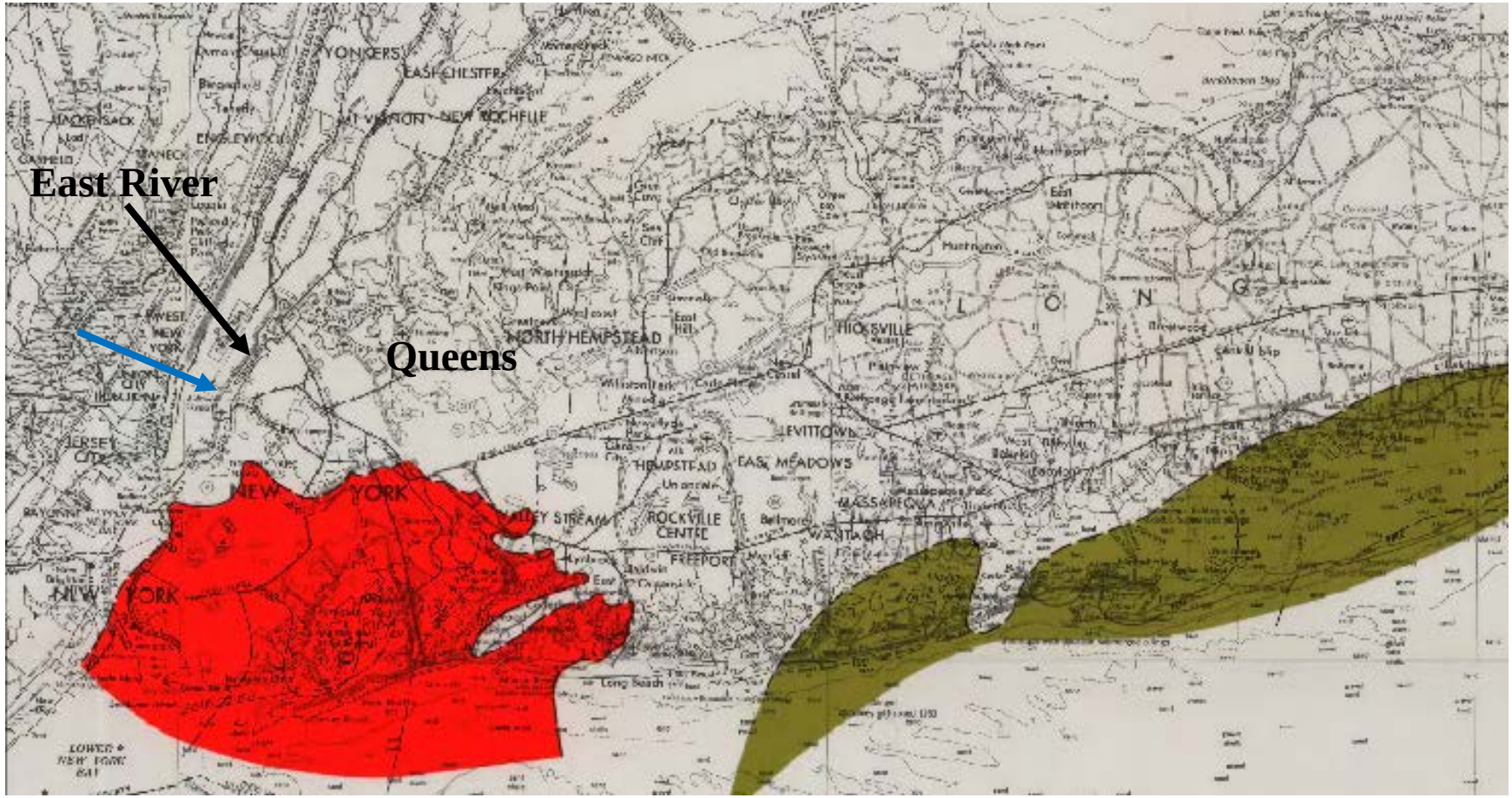
.3 Dated radiocarbon locality

Source: Cadwell 1989



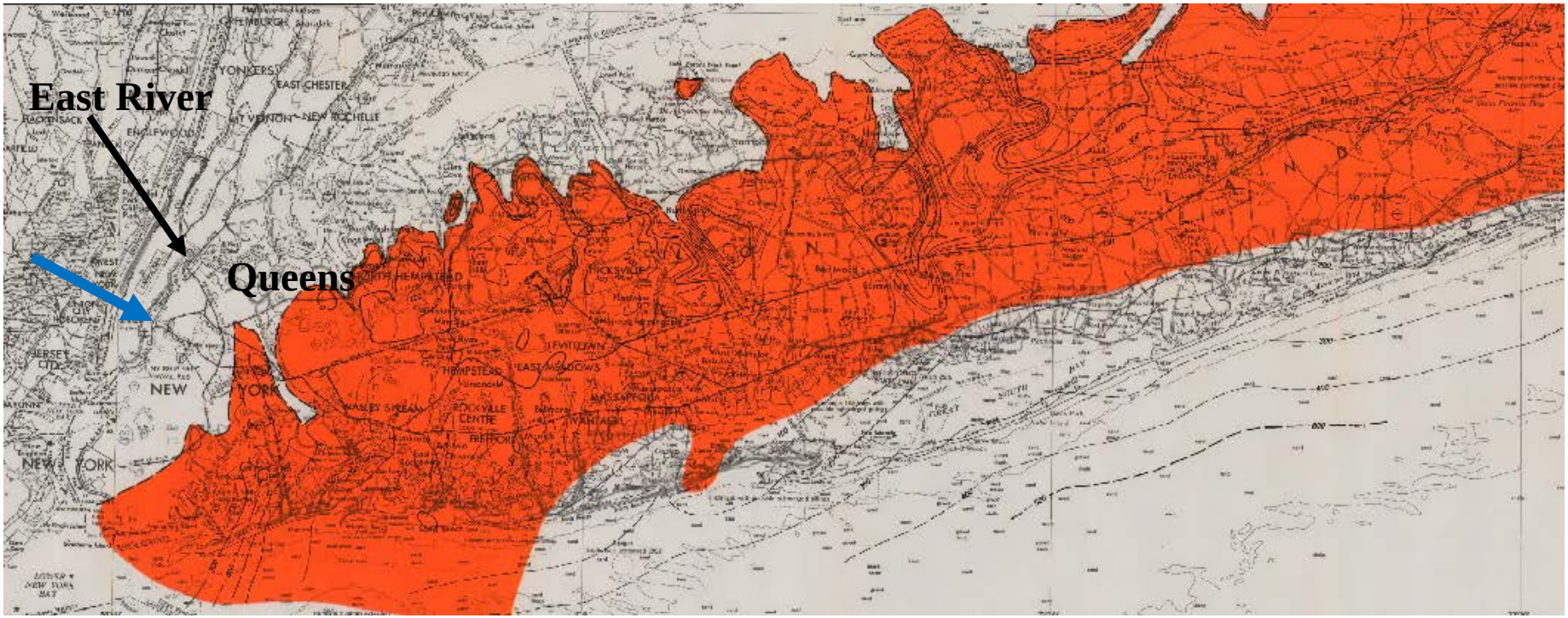
Source: Smolensky et al. 1989
Notes:
1. Brown color shows the extent of the mapped upper surface of Gardiners Clay on Long Island, New York.
2. The blue arrow shows the approximate location of the mouth of Newtown Creek.

Figure 4-14
Extent and Altitude of the Upper Surface of the Gardiners Clay
Data Applicability Report
Newtown Creek RI/FS



Source: Smolensky et al. 1989
Notes:
1. Red color shows the extent of the mapped upper surface of Jameco Aquifer on Long Island, New York.
2. The blue arrow shows the approximate location of the mouth of Newtown Creek.

Figure 4-15
Extent and Altitude of the Upper Surface of the Jameco Aquifer
Data Applicability Report
Newtown Creek RI/FS



Source: Smolensky et al. 1989
Notes:
1. Orange color shows the extent of the mapped upper surface of Magothy Aquifer on Long Island, New York.
2. The blue arrow shows the approximate location of the mouth of Newtown Creek.

Figure 4-16
Extent and Altitude of the Upper Surface of the Magothy Aquifer
Data Applicability Report
Newtown Creek RI/FS

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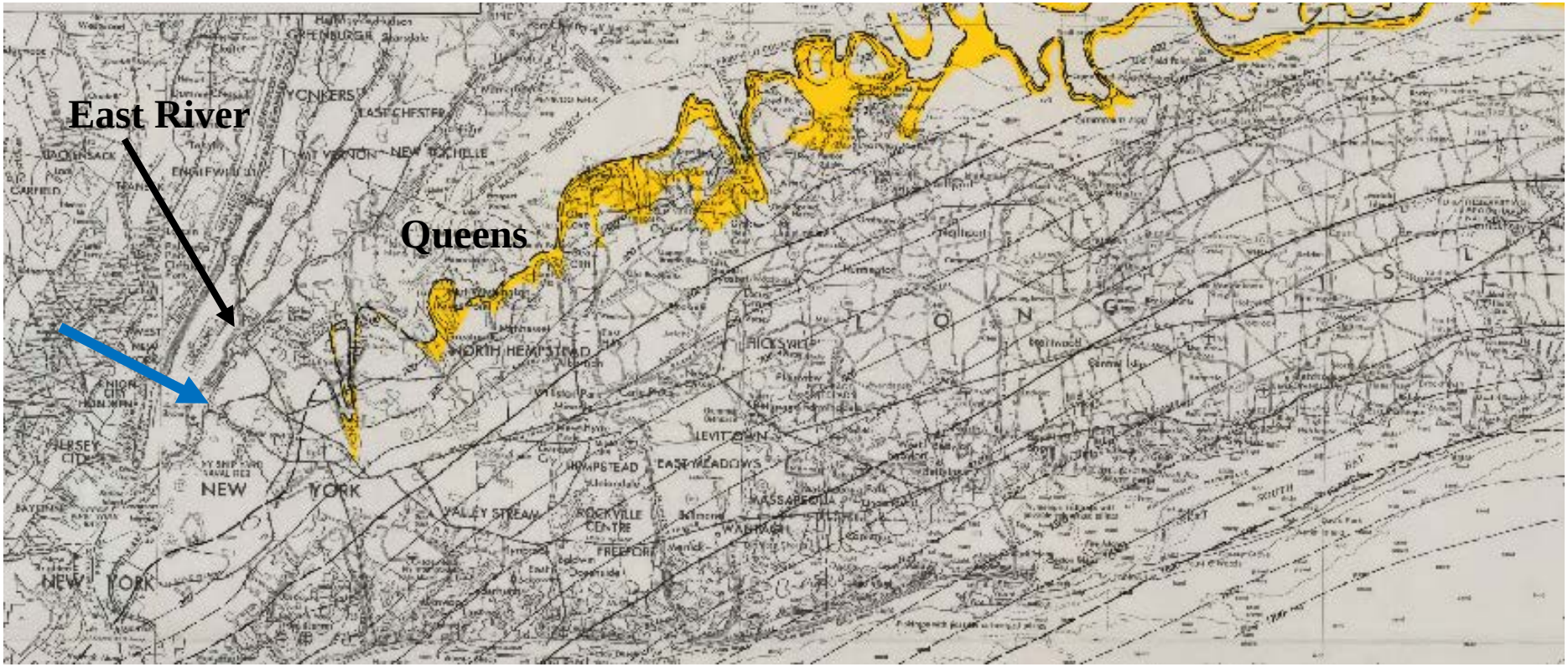
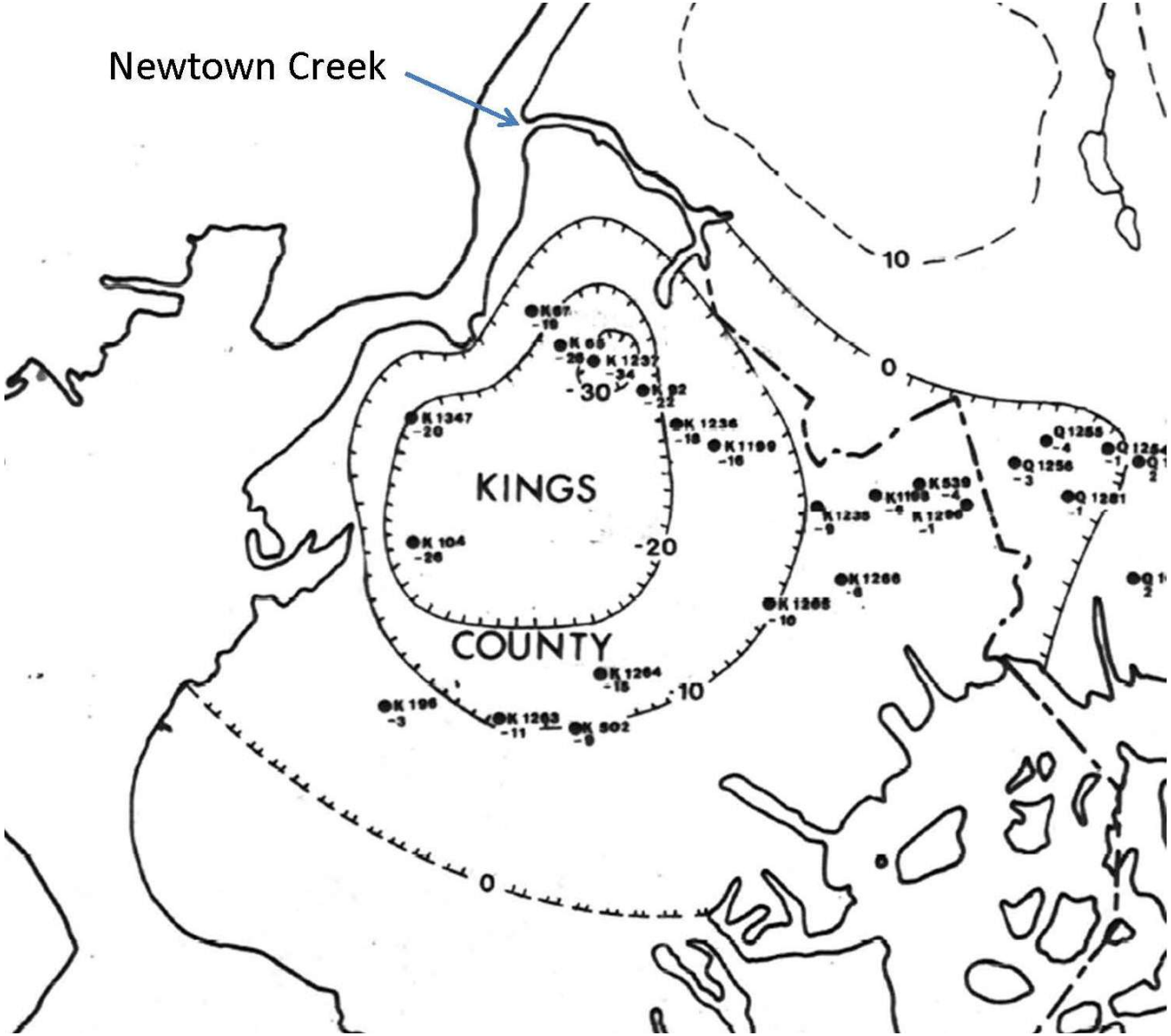


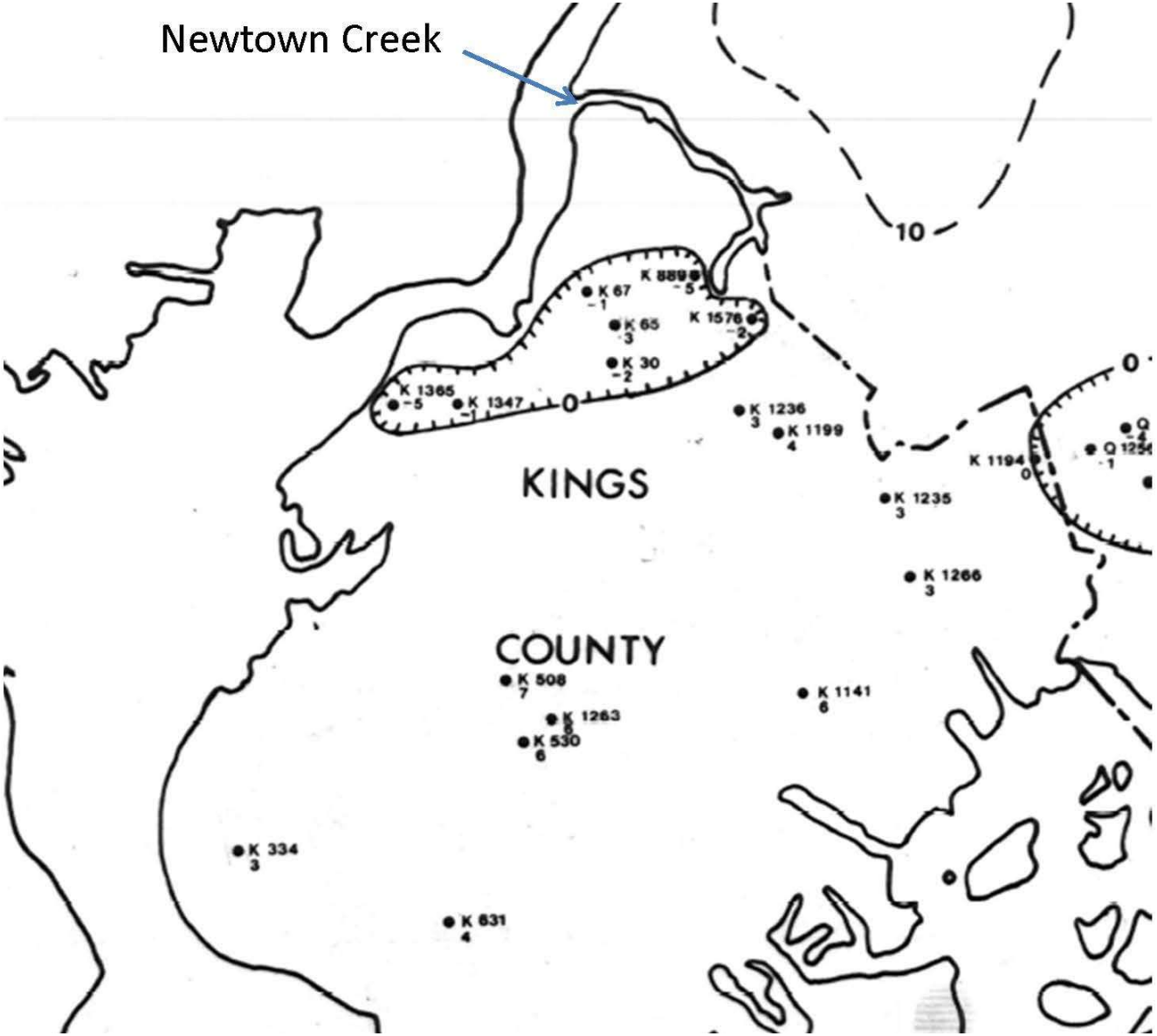
Source: Smolensky et al. 1989
Notes:
1. Yellow color shows the extent of the mapped upper surface of Magothy Aquifer on Long Island, New York.
2. The blue arrow shows the approximate location of the mouth of Newtown Creek.

Figure 4-17
Extent and Altitude of the Upper Surface of the Lloyd Aquifer
Data Applicability Report
Newtown Creek RI/FS



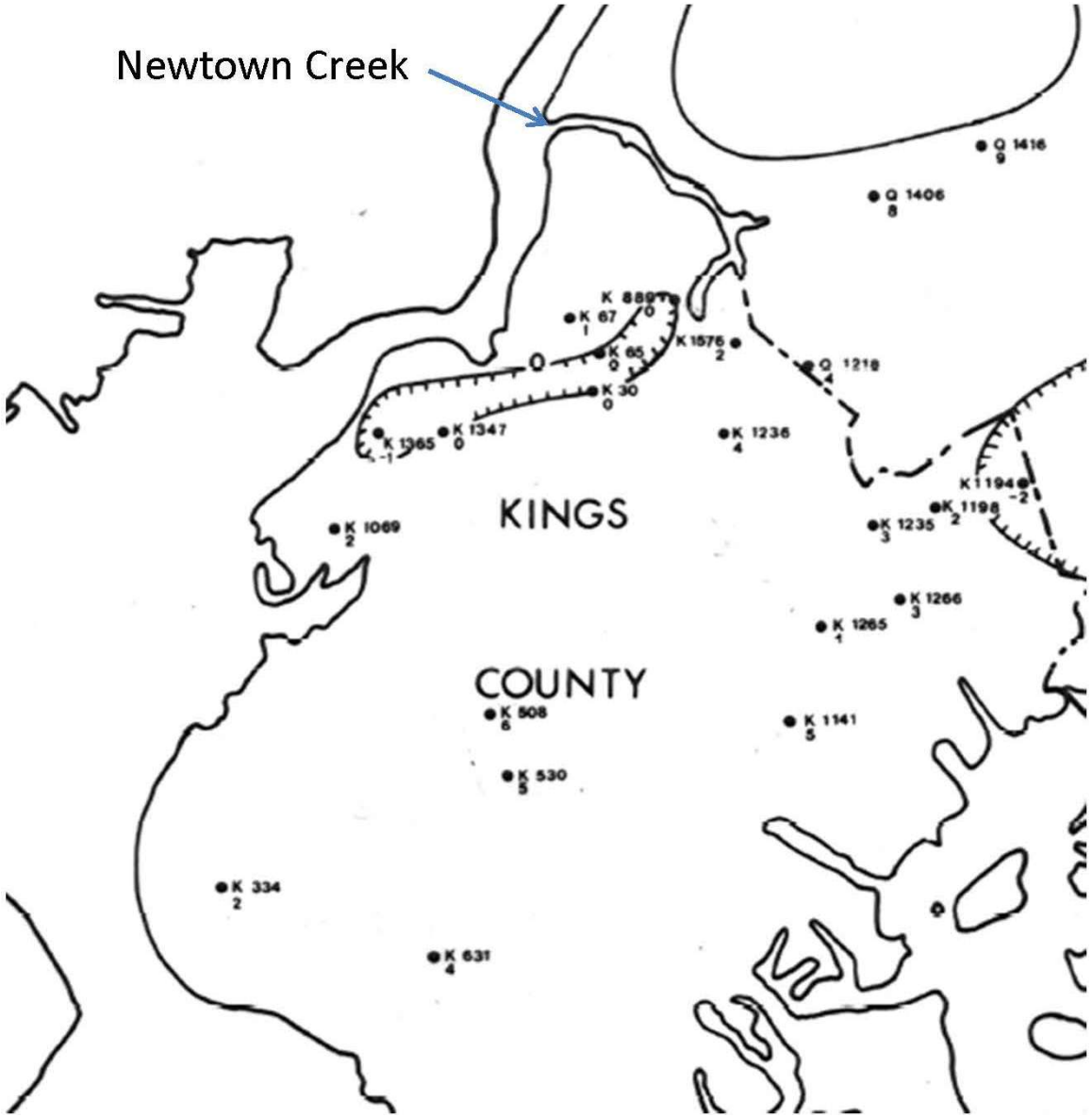
Source: Vaupel et al. 1977
Note:
1. Elevation measured by U.S. Geological Survey in feet, mean sea level.

Figure 4-18
Water Table Elevation in Kings County (1943)
Data Applicability Report
Newtown Creek RI/FS



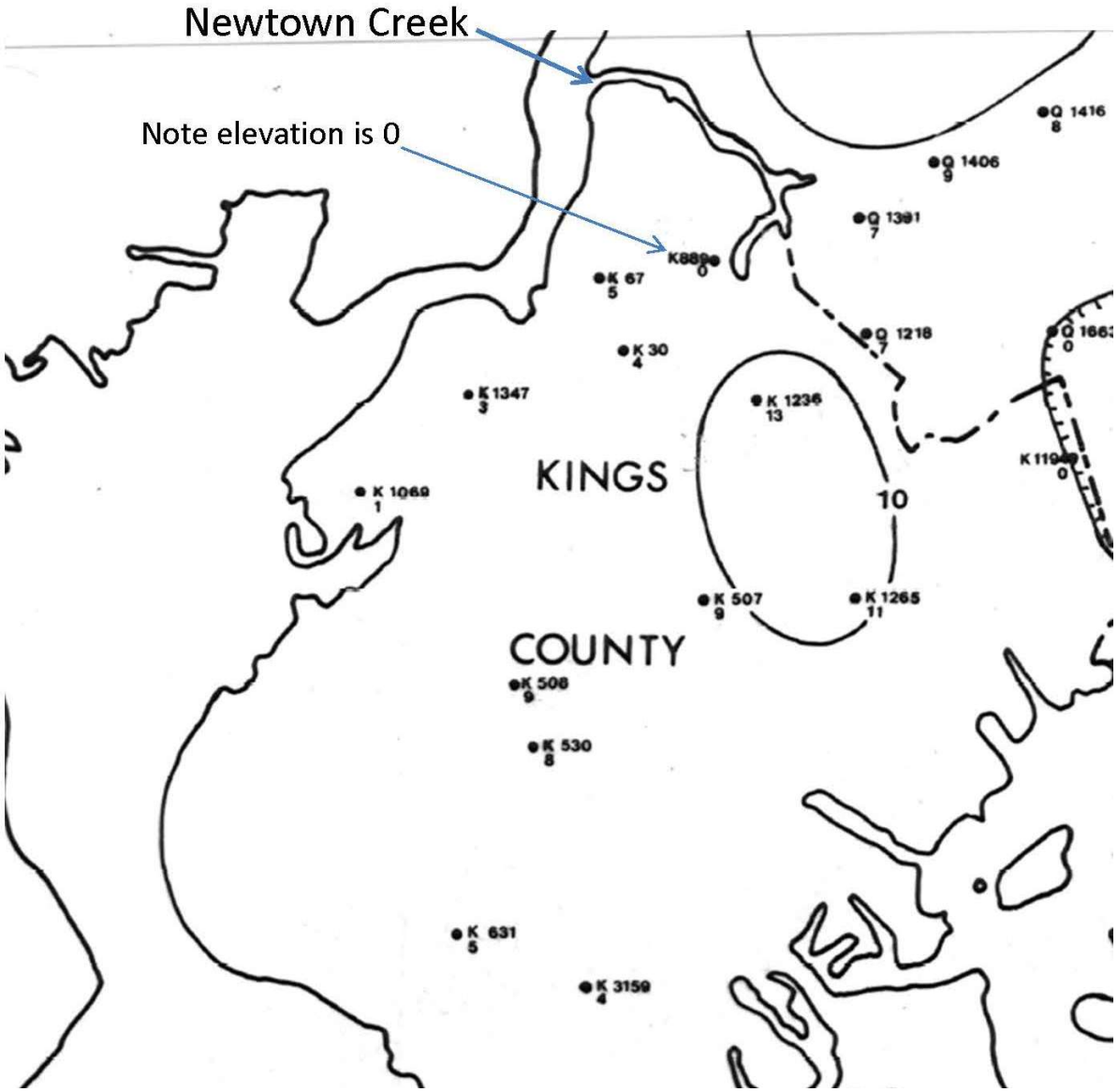
Source: Vaupel et al. 1977
Note:
1. Elevation measured by U.S. Geological Survey in feet, mean sea level.

Figure 4-19
Water Table Elevation in Kings County (1959)
Data Applicability Report
Newtown Creek RI/FS



Source: Vaupel et al. 1977
Note:
1. Elevation measured by U.S. Geological Survey in feet, mean sea level.

Figure 4-20
Water Table Elevation in Kings County (1966)
Data Applicability Report
Newtown Creek RI/FS



Source: Vaupel et al. 1977
Note:
1. Elevation measured by U.S. Geological Survey in feet, mean sea level.

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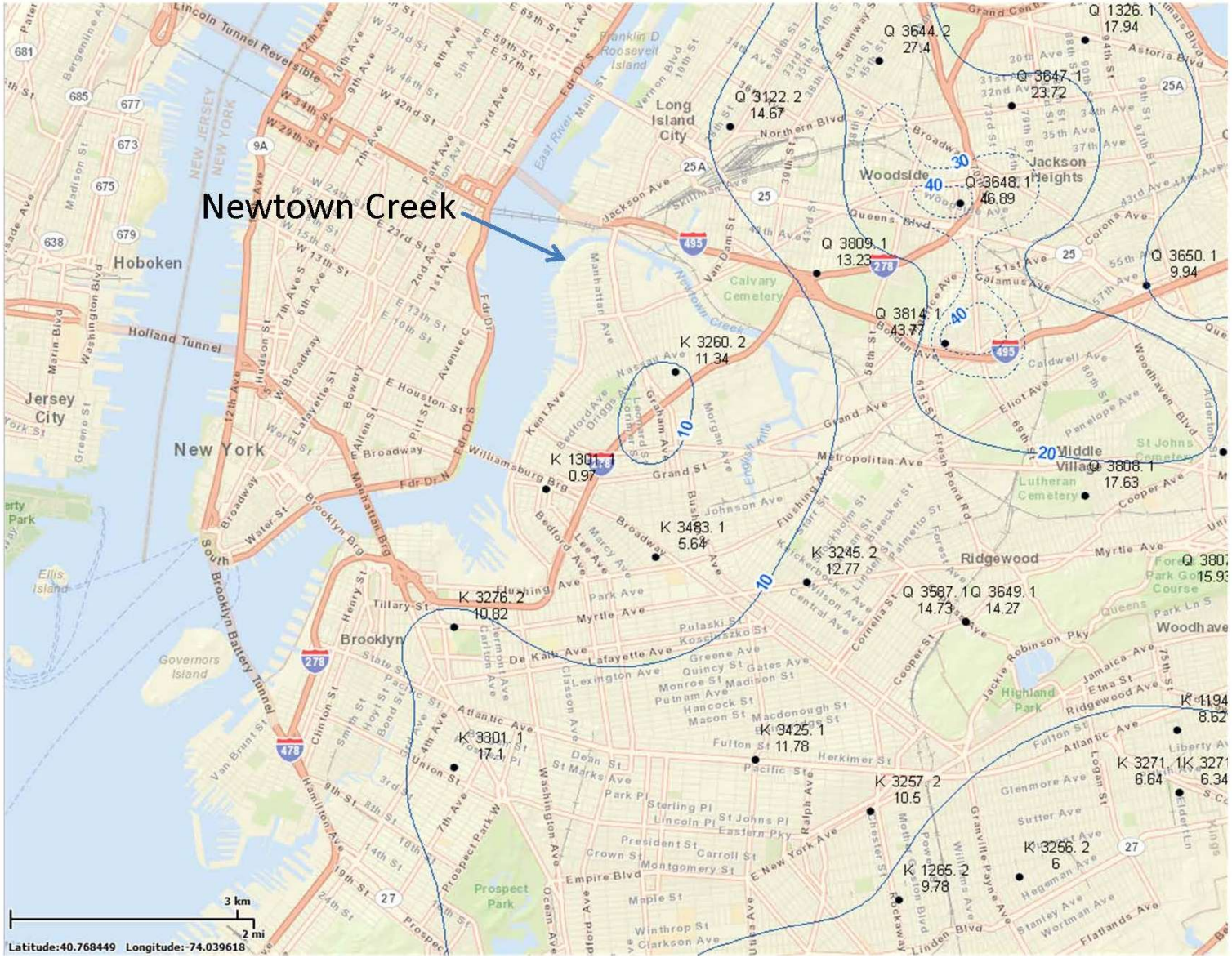
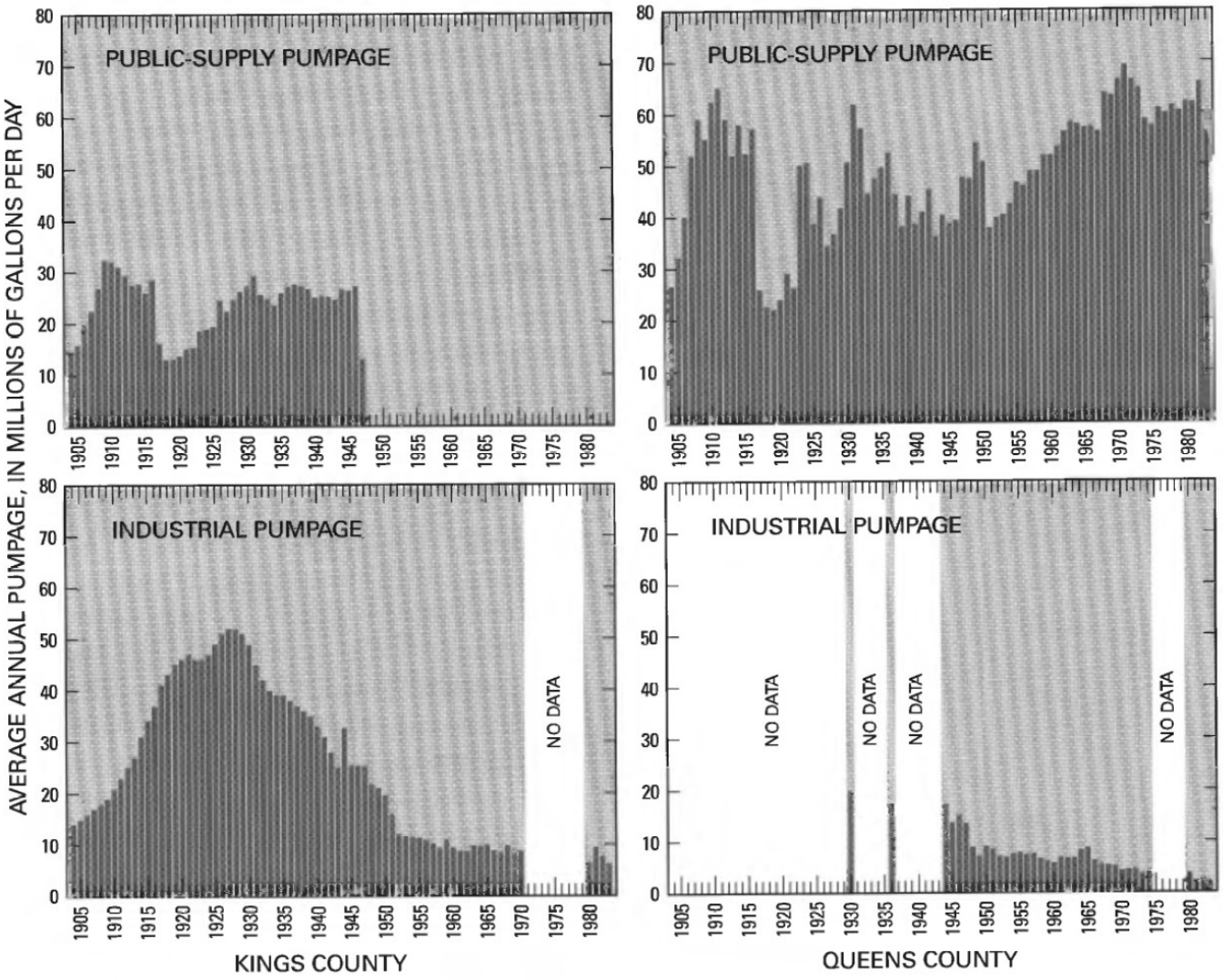
Figure 4-21
Water Table Elevation in Kings County (1972)
Data Applicability Report
Newtown Creek RI/FS



Source: USGS 2006
Note:
1. Elevation measured by U.S. Geological Survey in feet, mean sea level.



Source: Buxton and Shernoff 1999

Figure 4-23
Estimated Net Groundwater Withdrawal in Kings and Queens Counties, 1905 - 1990
Data Applicability Report
Newtown Creek RI/FS

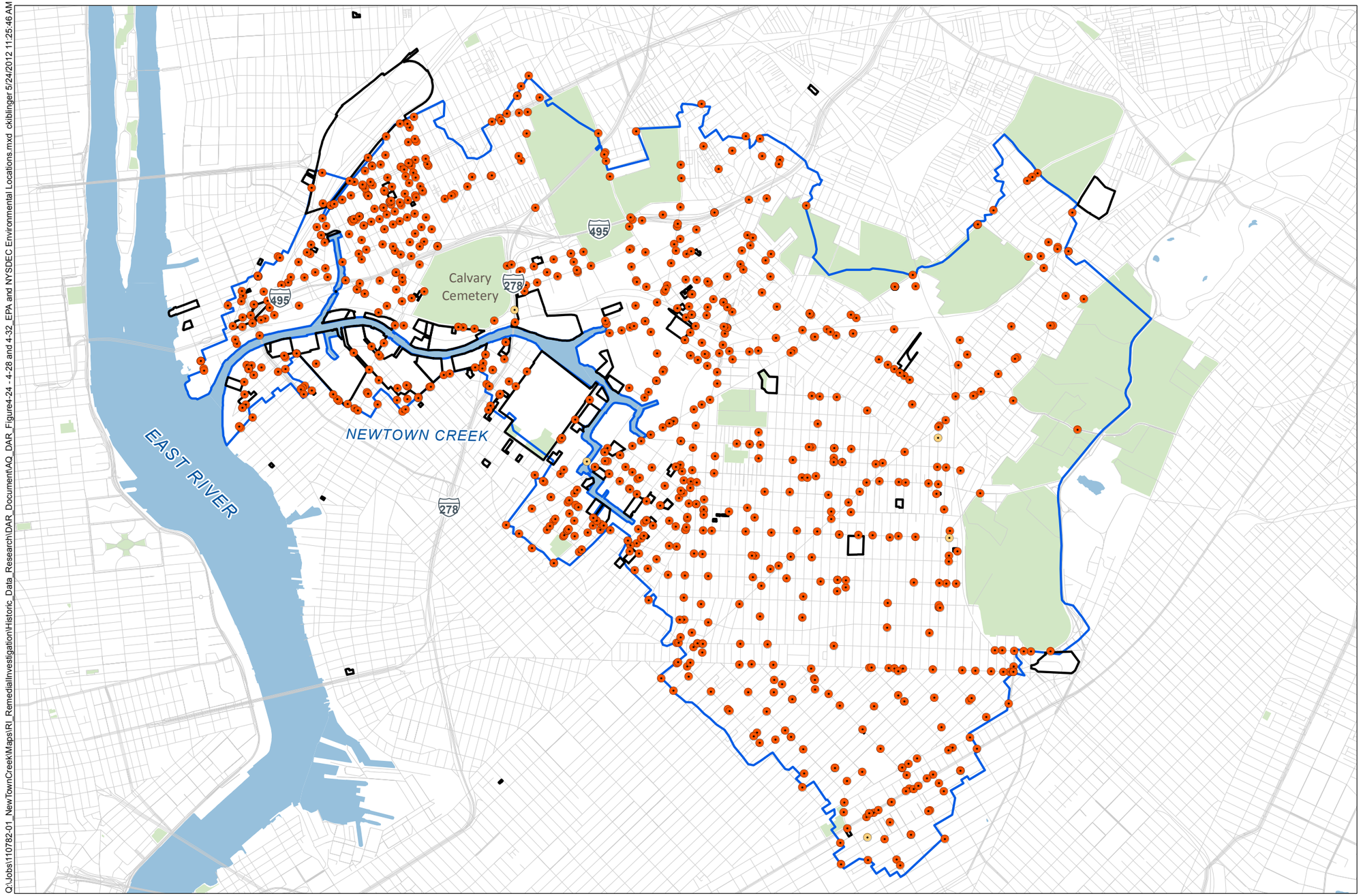


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Figure 4-24
USEPA CERCLA and RCRA Sites within Newtown Creek HDR Area
Data Applicability Report
Newtown Creek RI/FS

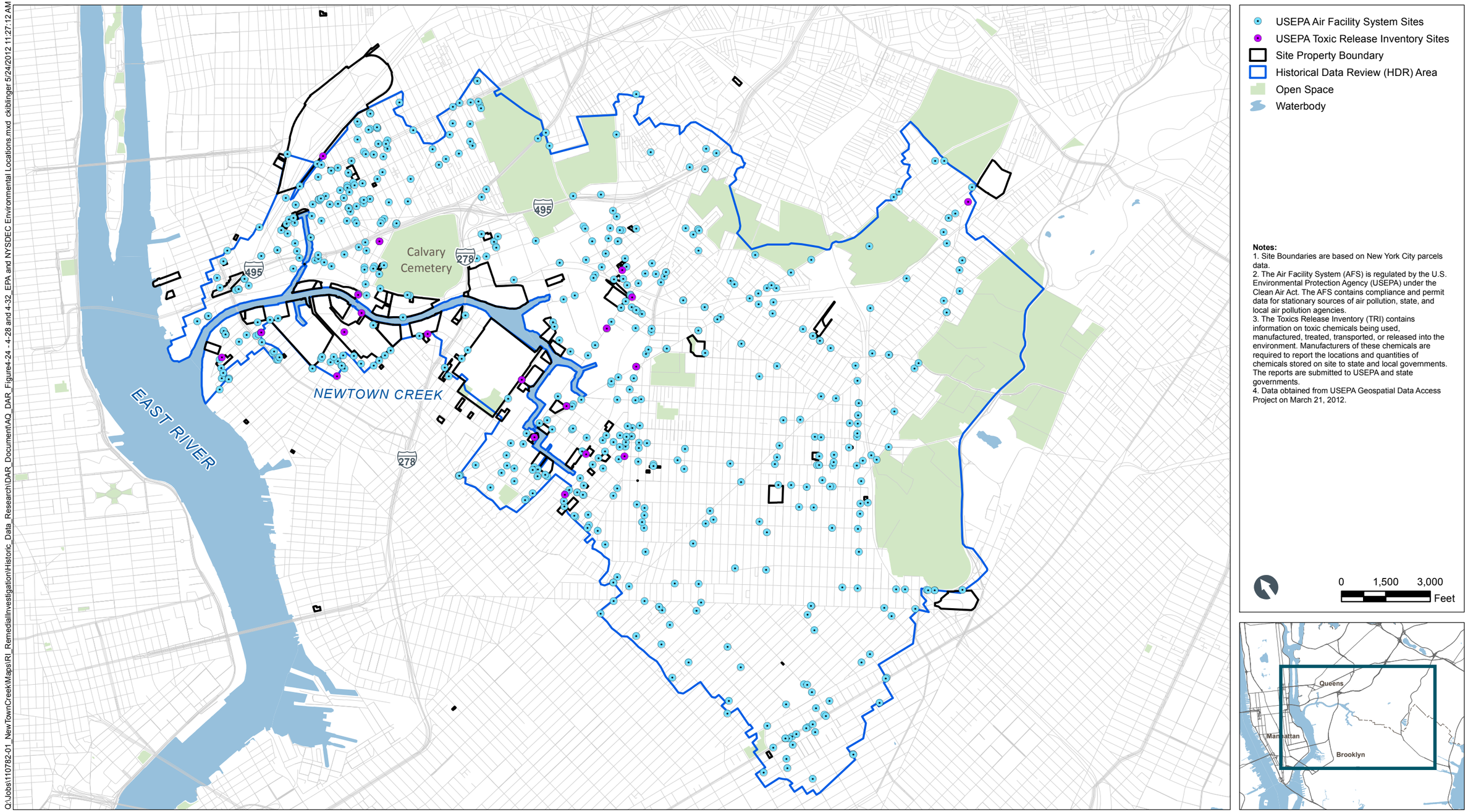

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Figure 4-25
USEPA AFS and TRI Sites within Newtown Creek HDR Area
Data Applicability Report
Newtown Creek RI/FS

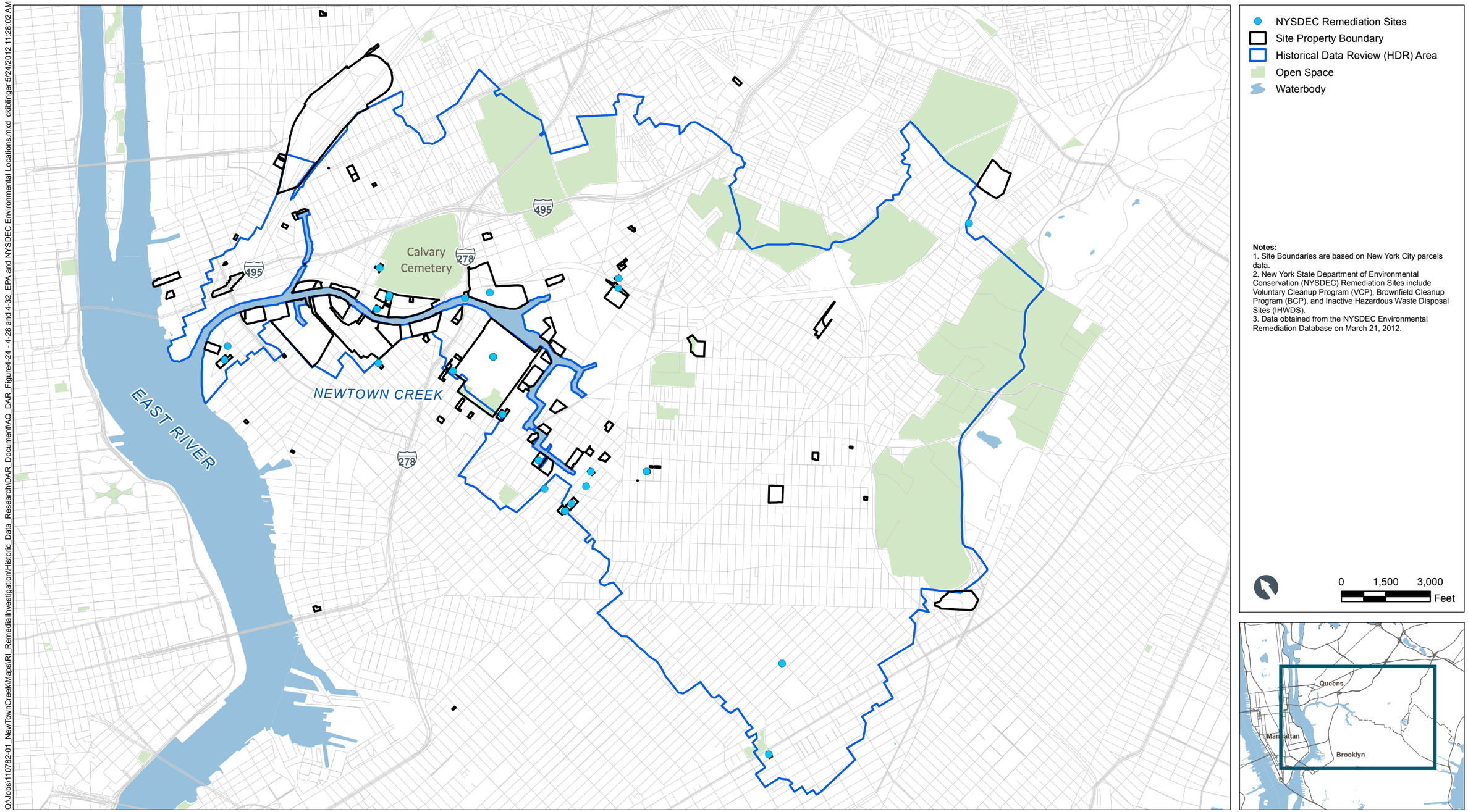

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Figure 4-26
NYSDEC Remediation Sites within Newtown Creek HDR Area
Data Applicability Report
Newtown Creek RI/FS

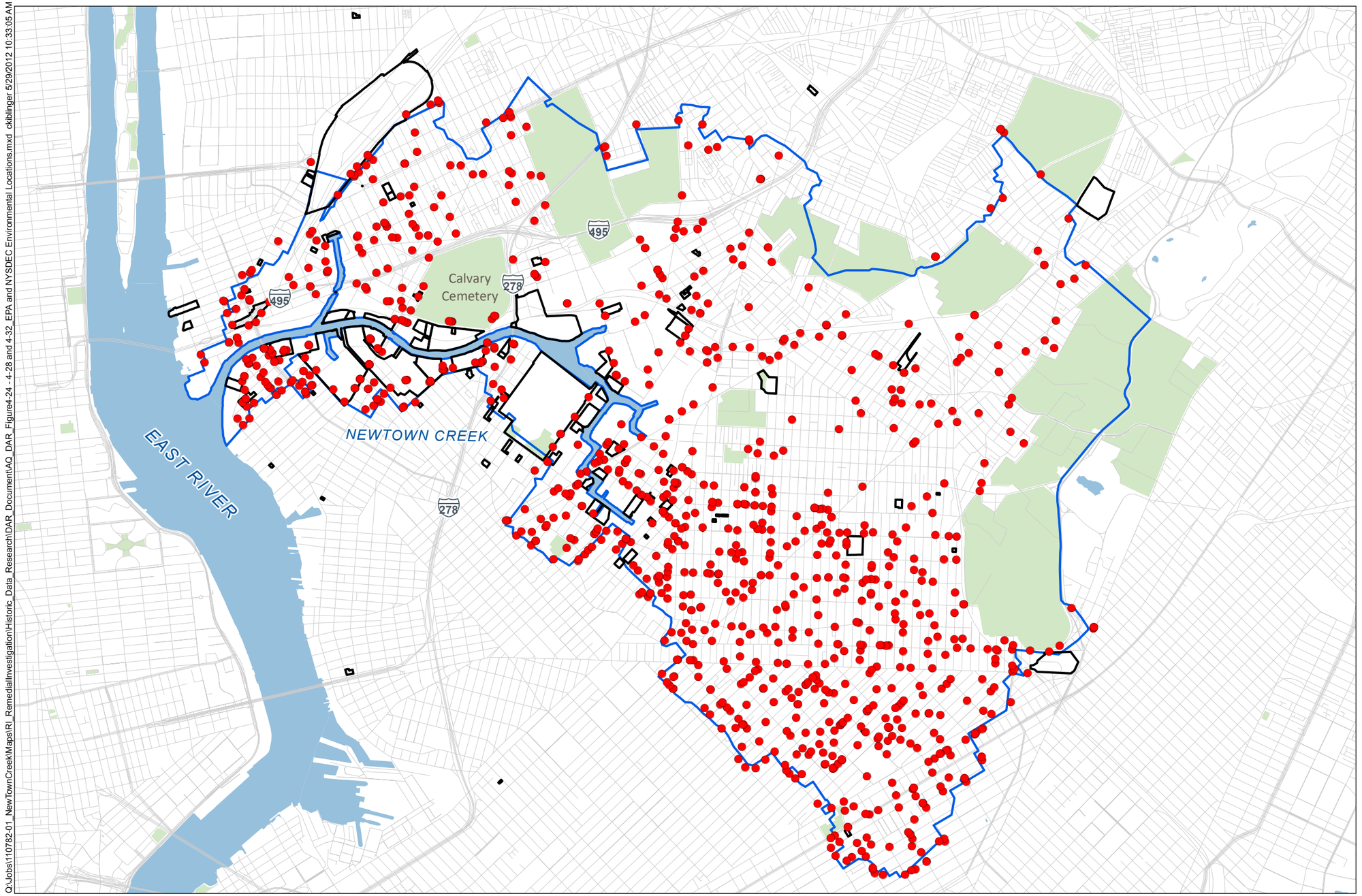

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Figure 4-27
NYSDEC Spills within Newtown Creek HDR Area
Data Applicability Report
Newtown Creek RI/FS

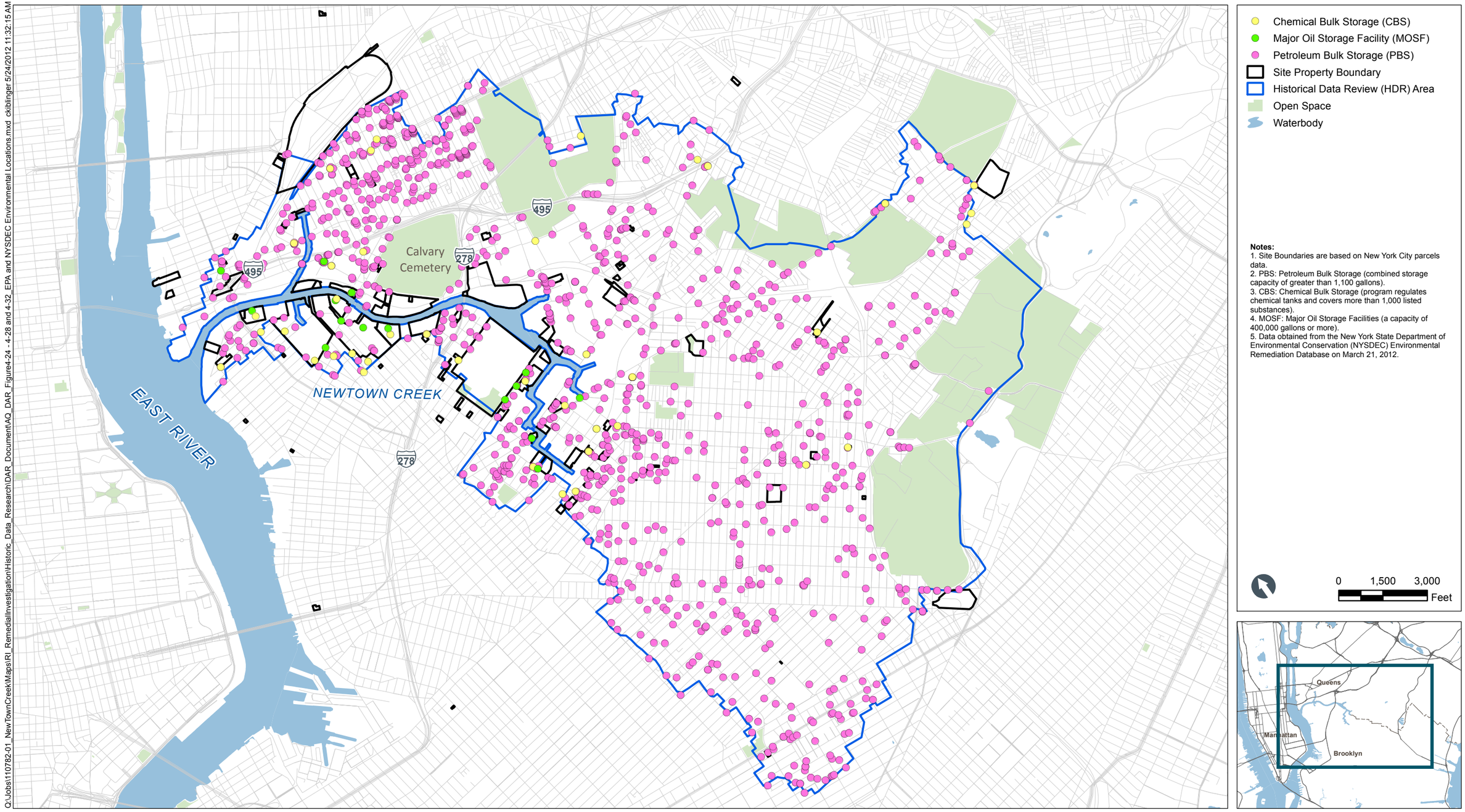

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Figure 4-28
NYSDEC Bulk Storage Facilities within Newtown Creek HDR Area
Data Applicability Report
Newtown Creek RI/FS

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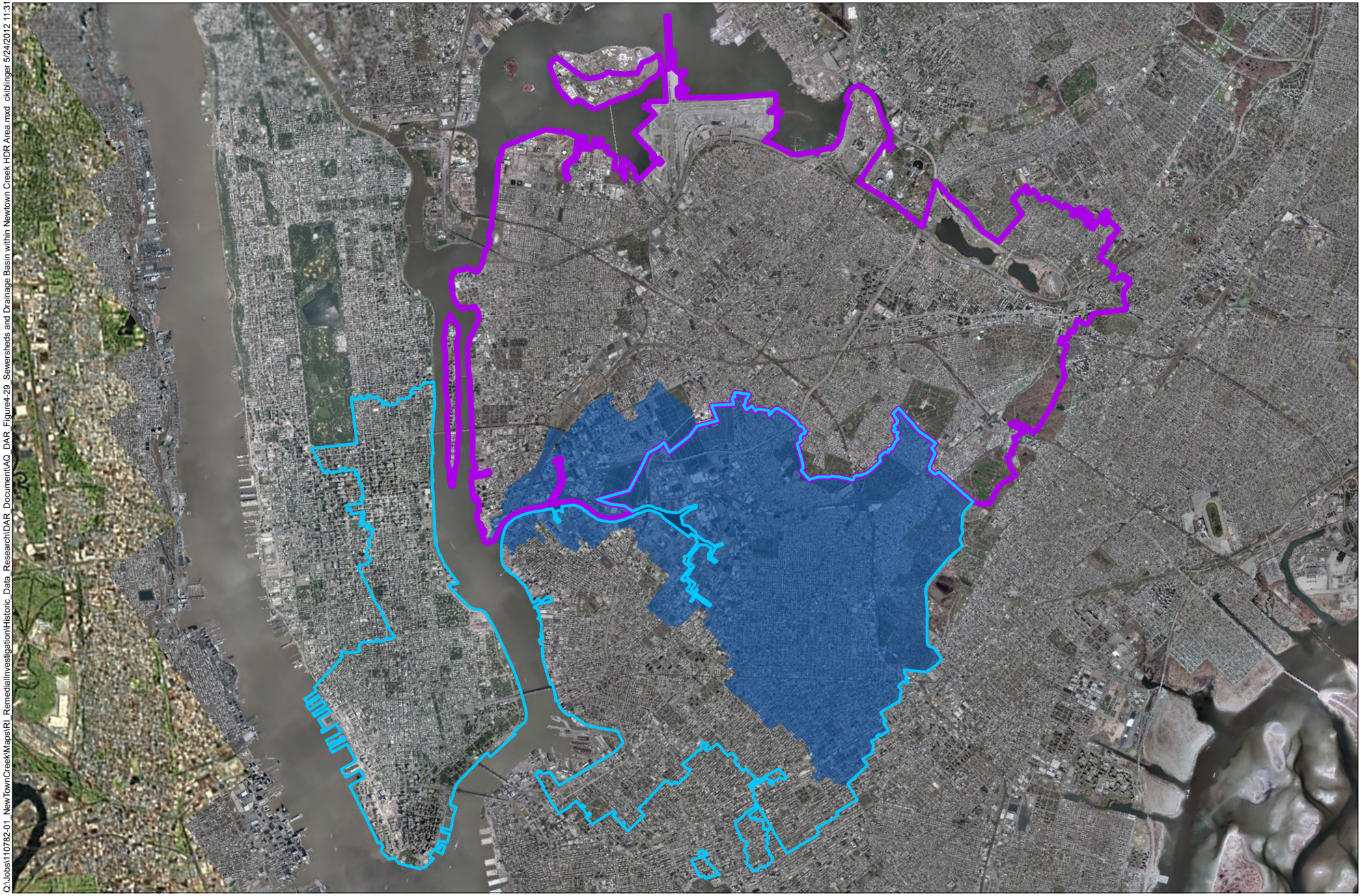

Newtown Creek WPCP Service Area
Bowery Bay WPCP Service Area
Newtown Creek Drainage Basin (HDR Area)

Notes:
1. HDR: Historical Data Review Area; NYCDEP: New York State Department of Environmental Conservation; WPCP: Water Pollution Control Plant.
2. Drainage and WPCP data from NYCDEP.
3. 2010 aerial photos from NYS Division of Homeland Security and Emergency Services.

0 3,000 6,000
Feet

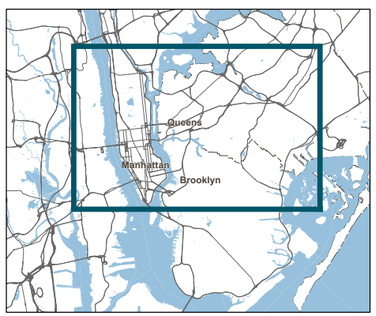

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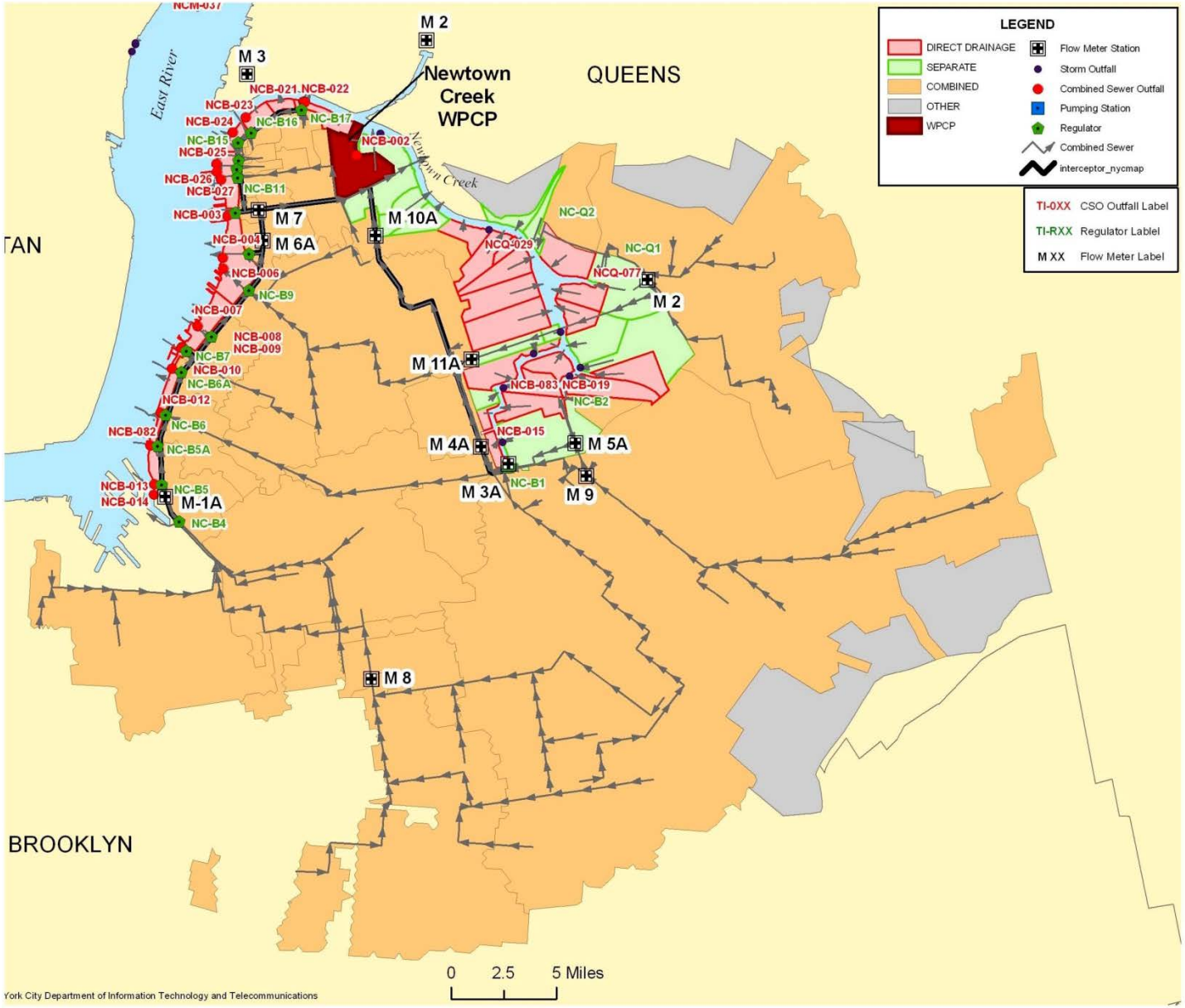
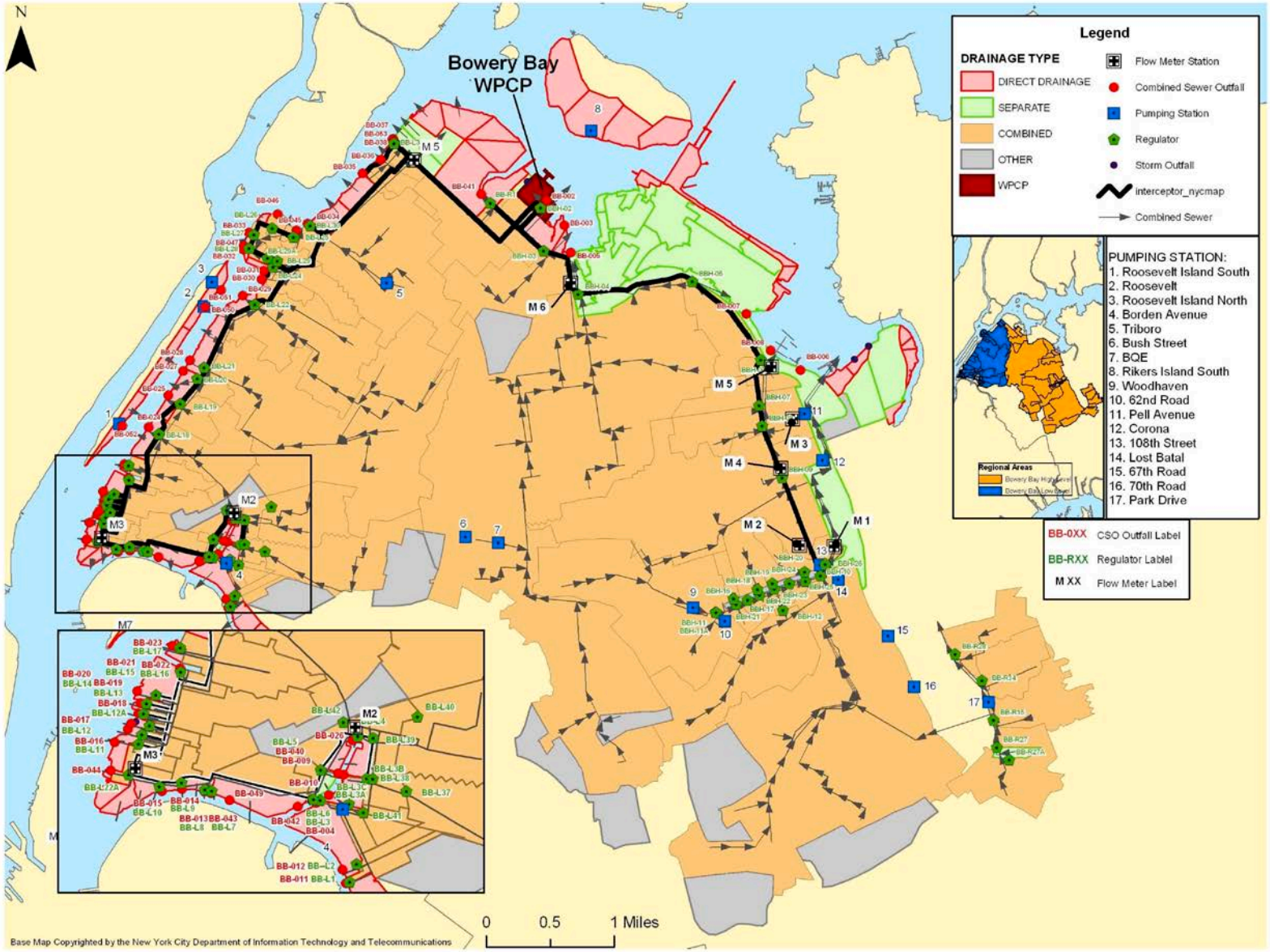
Figure 4-29
Sewersheds and Drainage Basin Associated with Newtown Creek HDR Area
Data Applicability Report
Newtown Creek RI/FS



Source: NYCDEP 2007c

Figure 4-30
Interceptor Map of the Newtown Creek WPCP Brooklyn Drainage Area
Data Applicability Report
Newtown Creek RI/FS



Source: NYCDEP 2007b

Figure 4-31
Interceptor Map of the Bowery Bay WPCP Brooklyn Drainage Area
Data Applicability Report
Newtown Creek RI/FS

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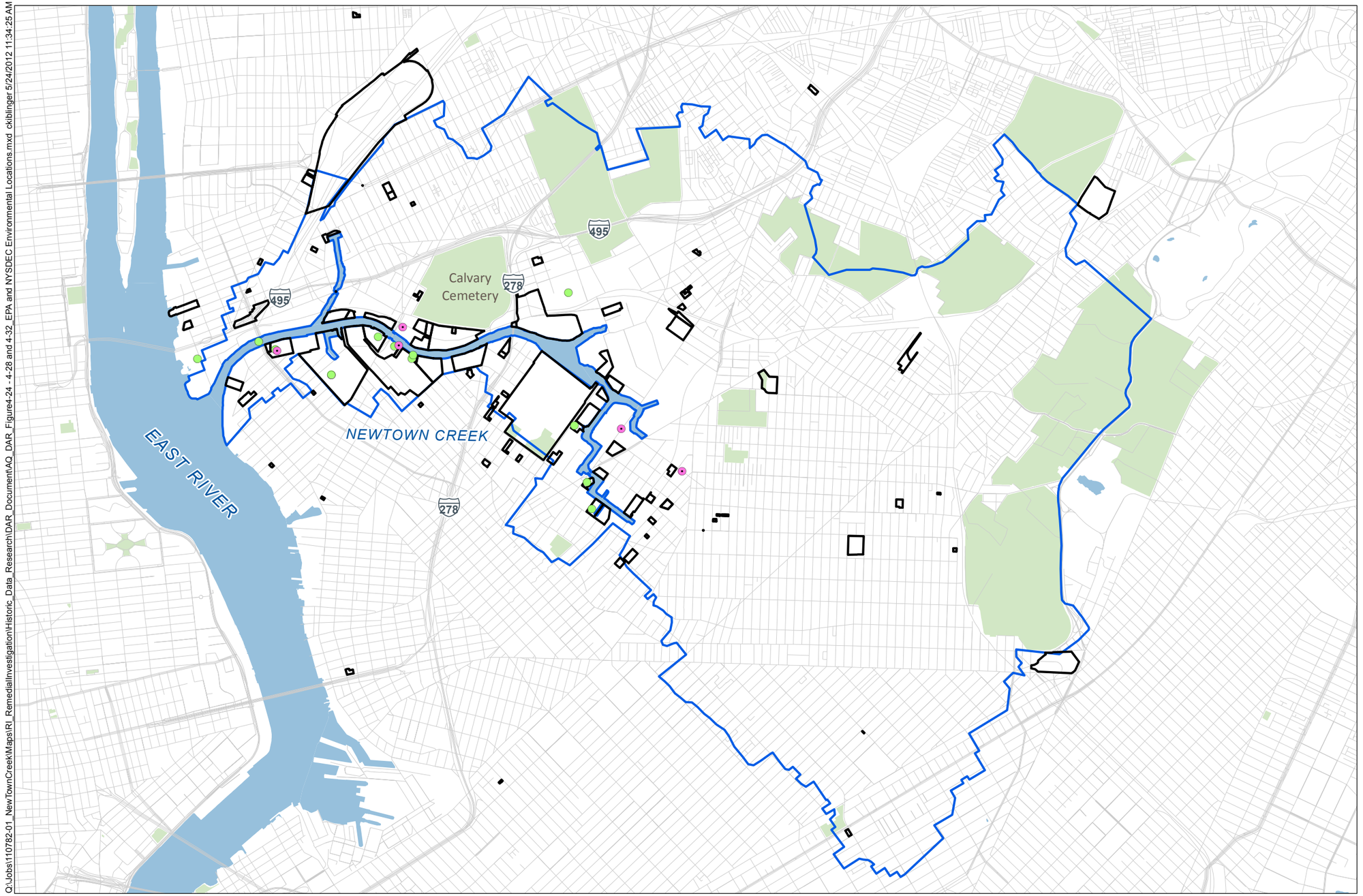

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Figure 4-32
SPDES and NPDES Permitted Sites
Data Applicability Report
Newtown Creek RI/FS

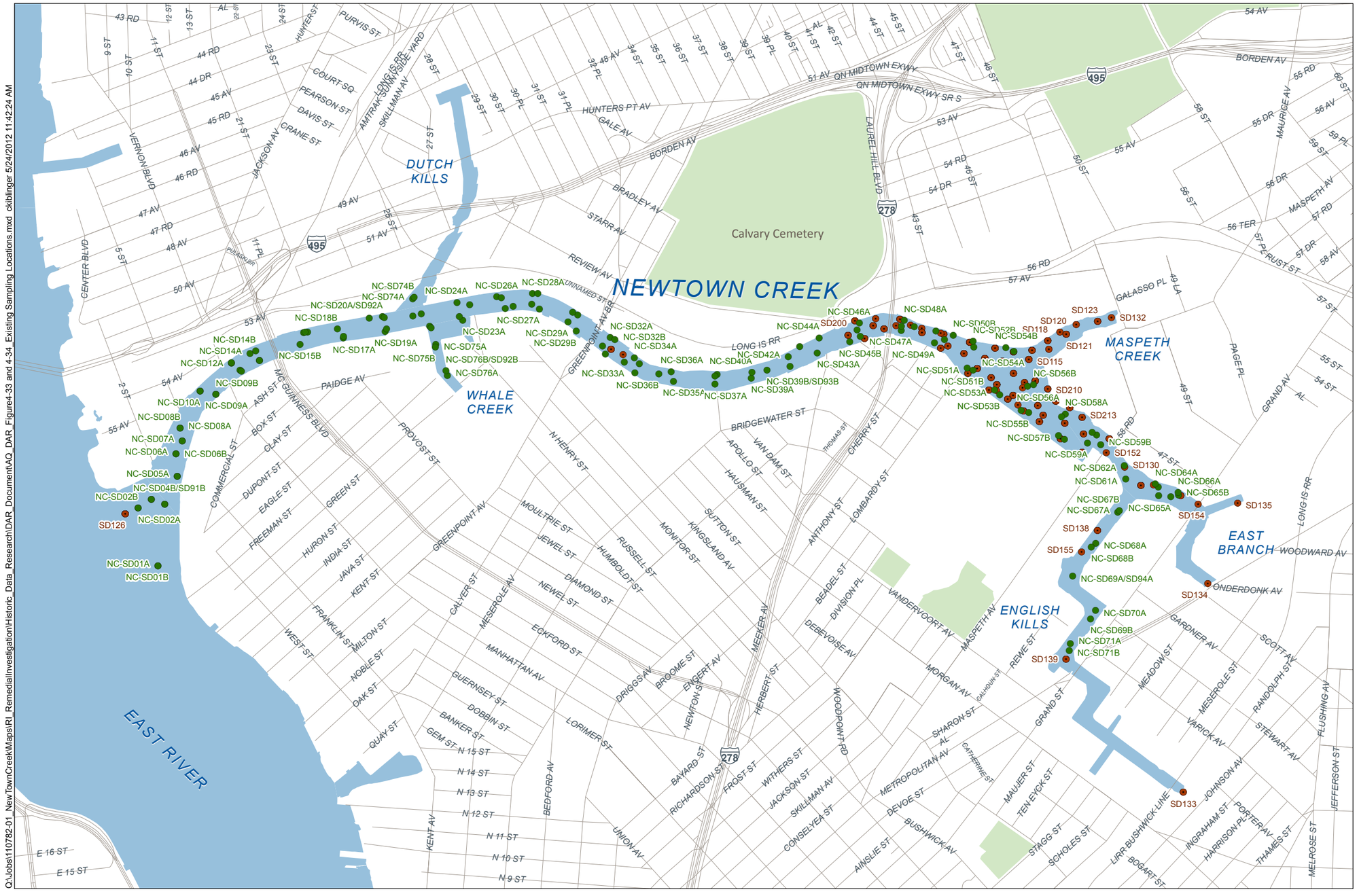

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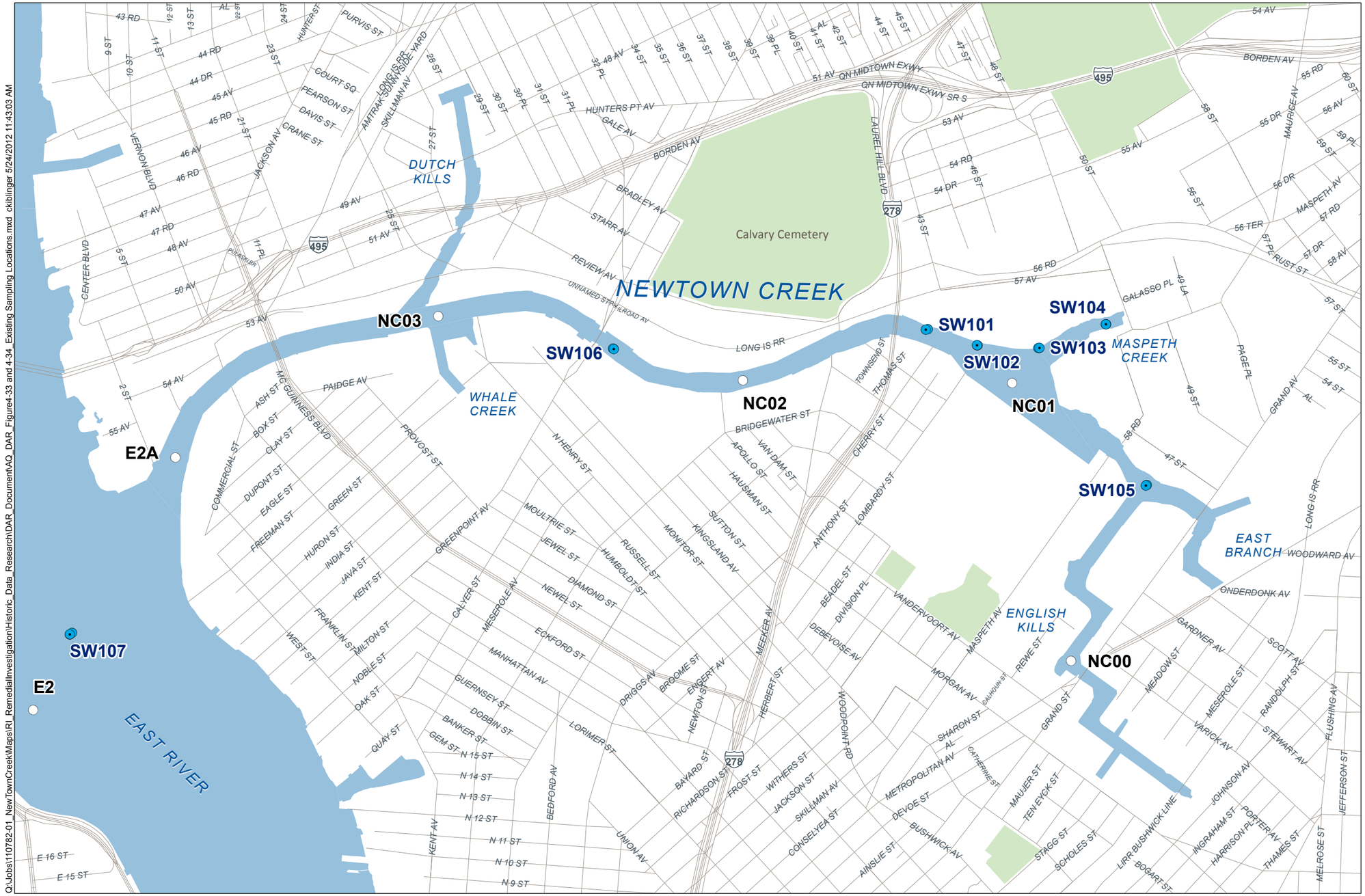
Figure 4-33
Existing Sediment Sampling Locations
Data Applicability Report
Newtown Creek RI/FS



OU6 (Laurel Hill)
Surface Water Sampling Stations

East River Special Tributaries Study

Waterbody

Open Space

Note:
East River Special Tributaries Study locations are approximate.

0 500 1,000 1,500
Feet

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Figure 4-34
Existing Surface Water Sampling Locations
Data Applicability Report
Newtown Creek RI/FS

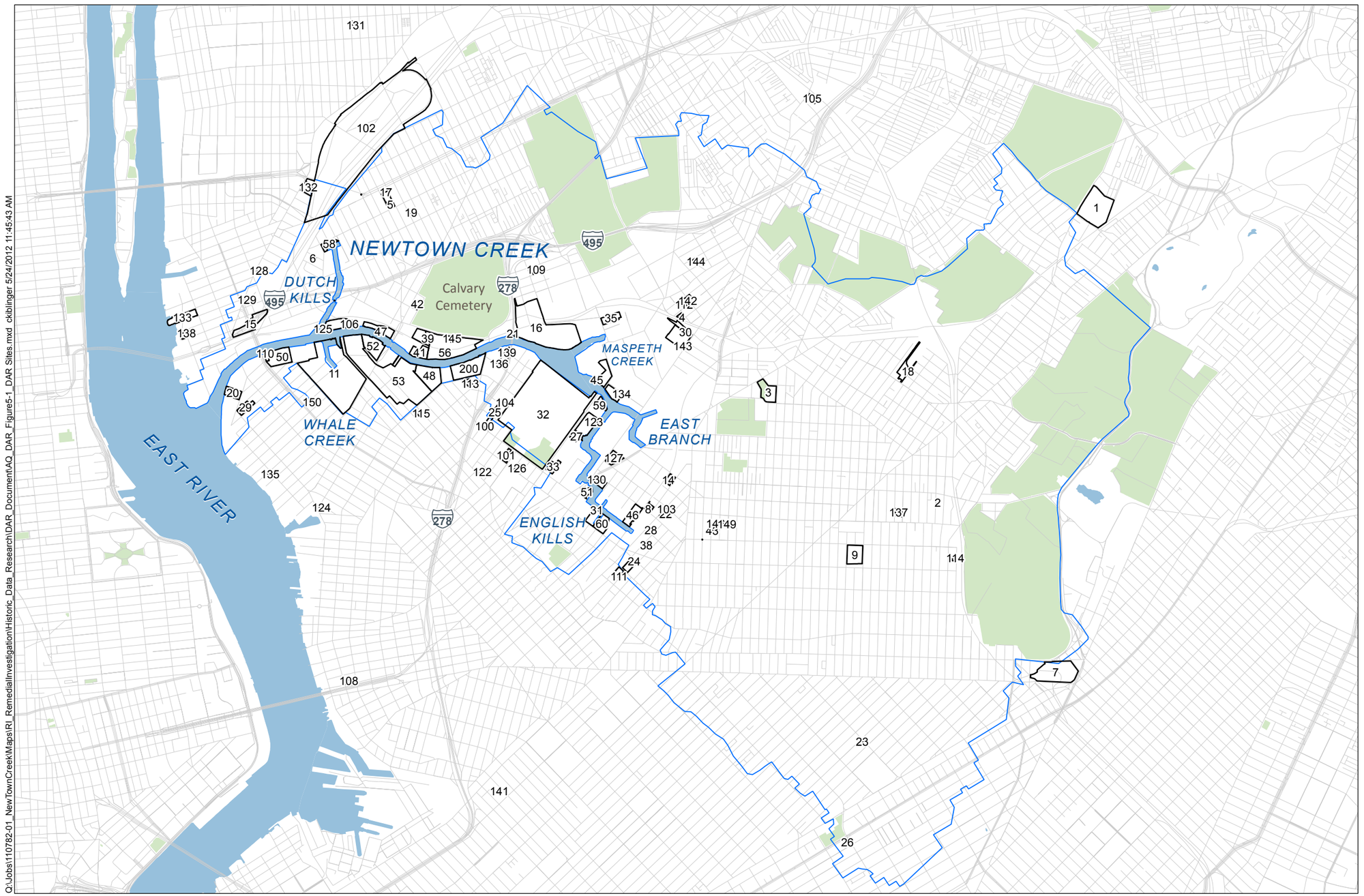

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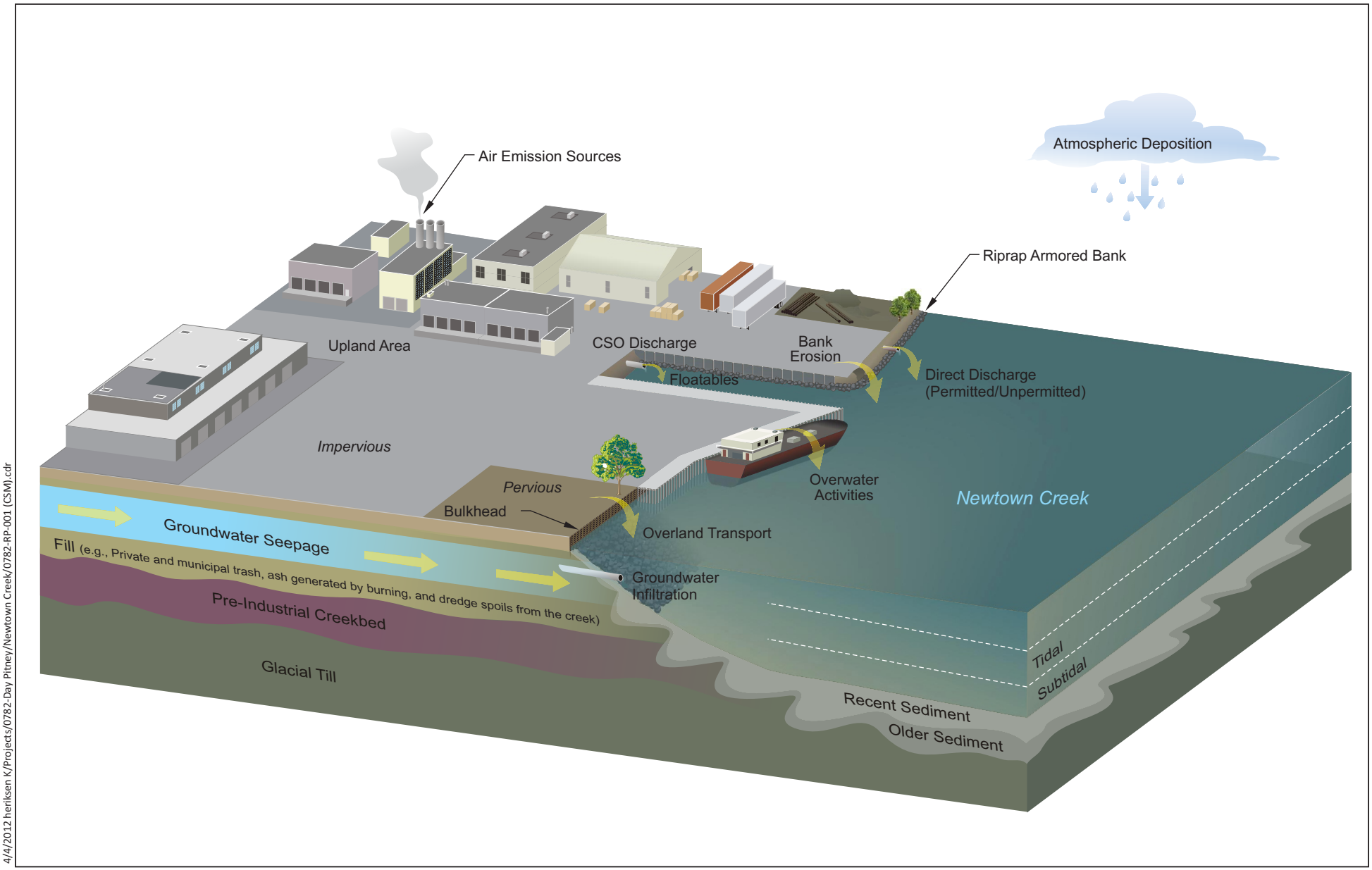
Figure 5-1
DAR Sites
Data Applicability Report
Newtown Creek RI/FS



4/4/2012 heriksen K:/Projects/0782-Day Pitney/Newtown Creek/0782-RP-001 (CSM).cdr

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Figure 5-2
Conceptual Cross Section of Pathways
Data Applicability Report
Newtown Creek RI/FS

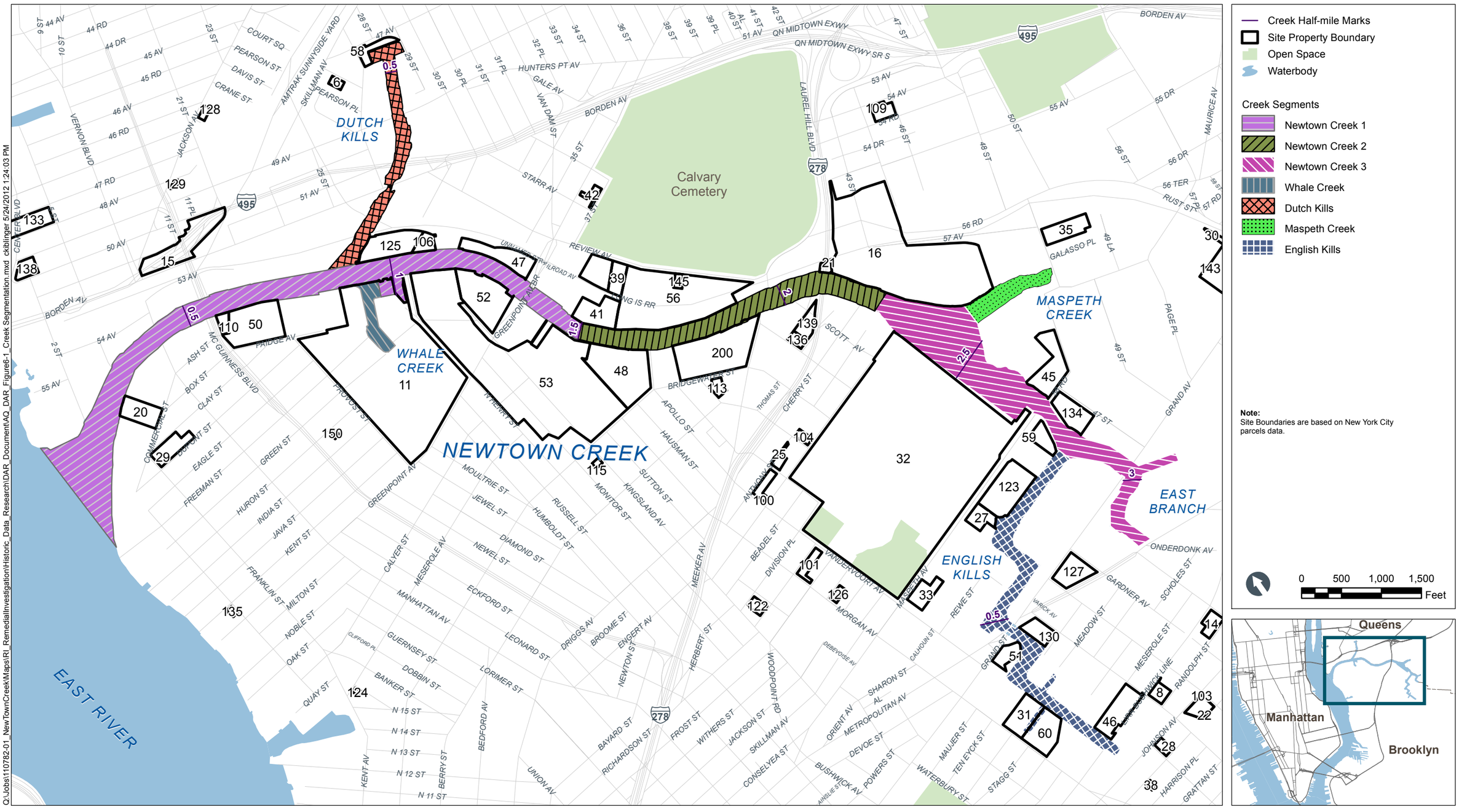

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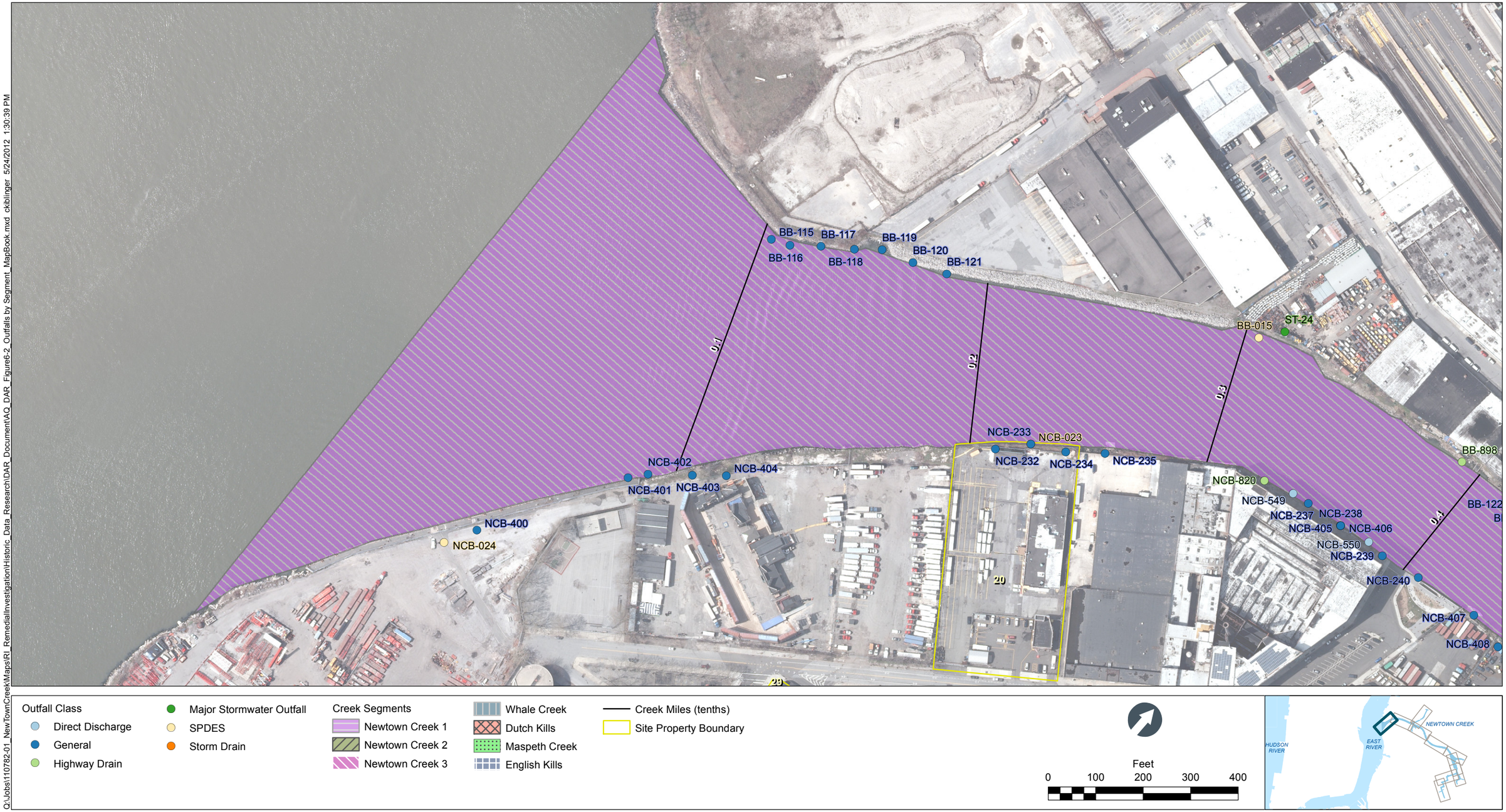
Figure 6-1
Creek Segmentation
Data Applicability Report
Newtown Creek RI/FS



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Notes:
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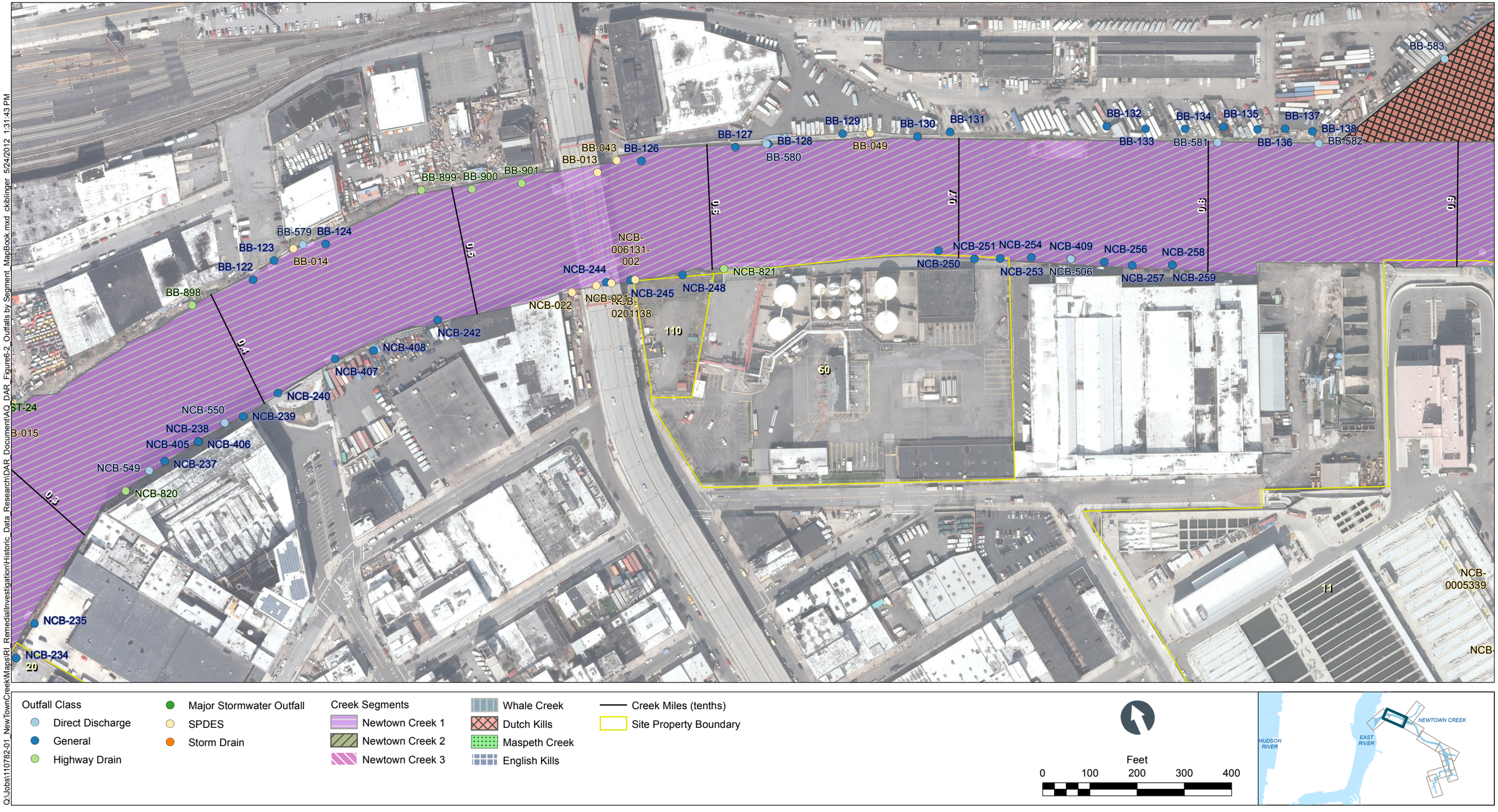
Figure 6-2a
Outfalls by Segment - Newtown Creek 1
Data Applicability Report
Newtown Creek RI/FS



Outfall Class
- Direct Discharge
- General
- Highway Drain
- Major Stormwater Outfall
- SPDES
- Storm Drain

Creek Segments
- Newtown Creek 1
- Newtown Creek 2
- Newtown Creek 3
- Whale Creek
- Dutch Kills
- Maspeth Creek
- English Kills

- Creek Miles (tenths)
- Site Property Boundary

Feet
0 100 200 300 400

Q:\Jobs\110782-01_NewTownCreek\Maps\RI_RemedialInvestigation\Historic_Data_Research\DAR_Document\AQ_DAR_Figure6-2_Outfalls by Segment_MapBook.mxd ckiblinger 5/24/2012 1:31:43 PM

Notes:
1. Outfall labeling: BB: Bowery Bay; NC(B/Q): Newtown Creek, Brooklyn/Queens; ST: Stormwater; SPDES: State Pollutant Discharge Elimination System.
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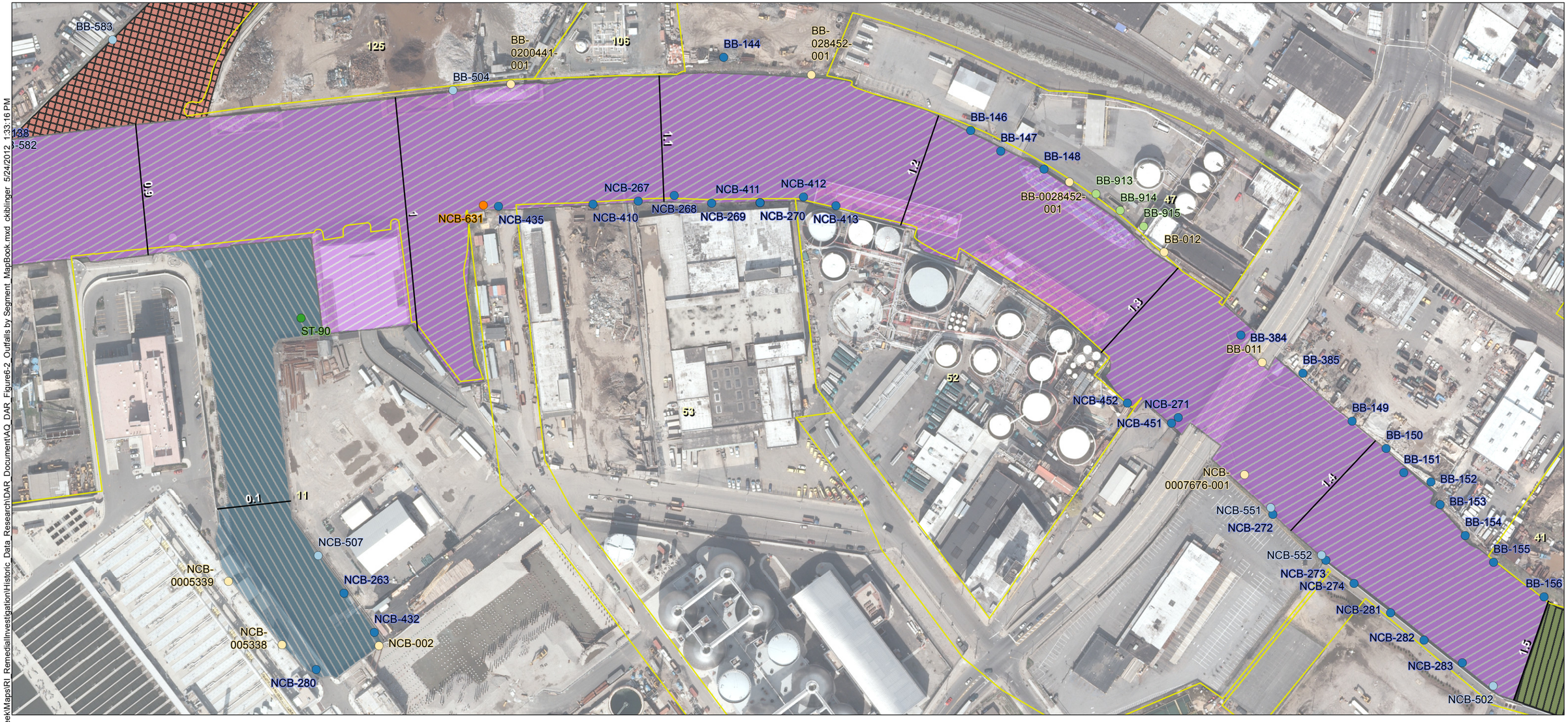
Figure 6-2b
Outfalls by Segment - Newtown Creek 1
Data Applicability Report
Newtown Creek RI/FS



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Notes:
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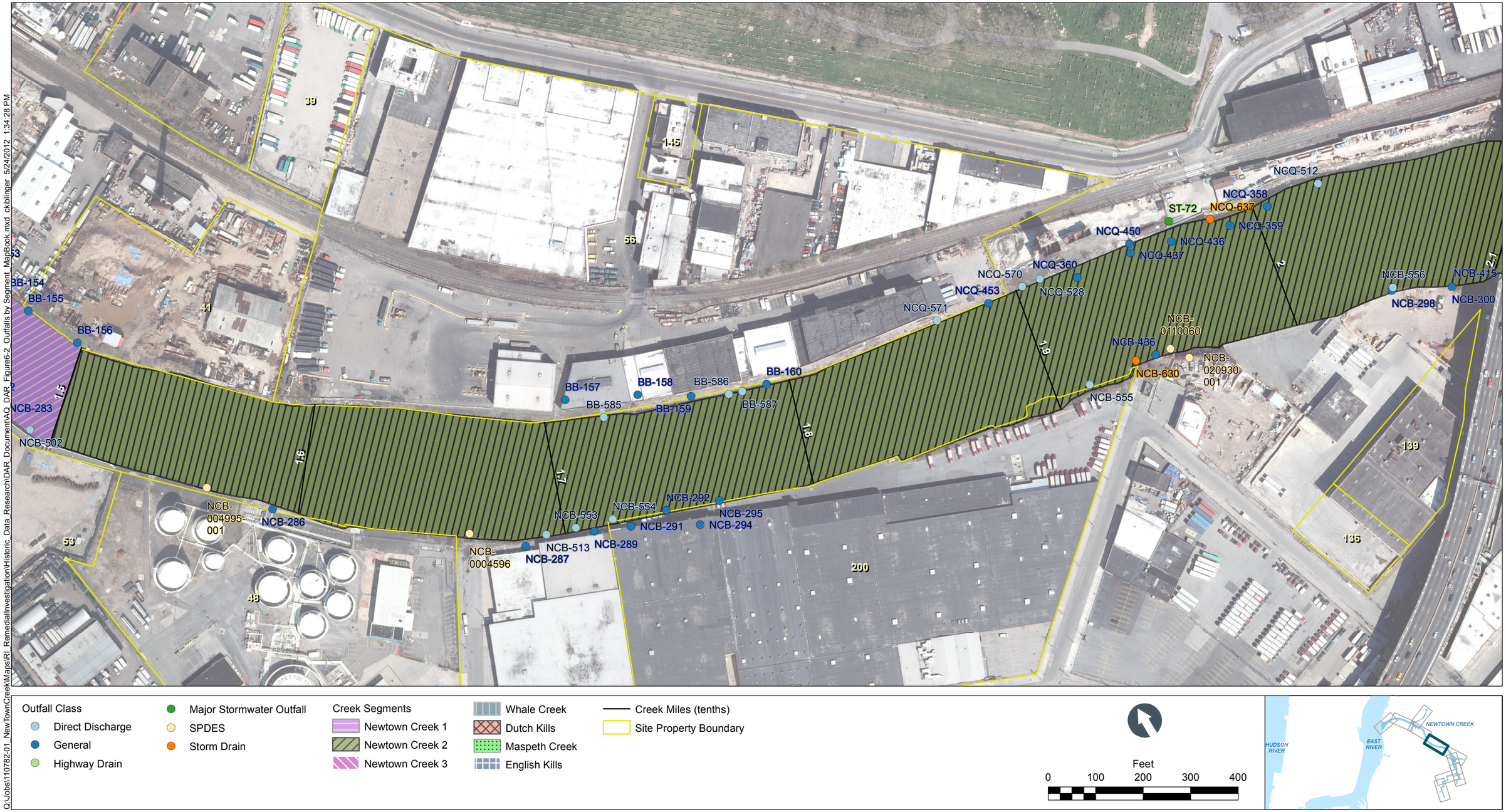
Figure 6-2c
Outfalls by Segment - Whale Creek and Newtown Creek 1
Data Applicability Report
Newtown Creek RI/FS



Outfall Class
- Direct Discharge
- General
- Highway Drain
- Major Stormwater Outfall
- SPDES
- Storm Drain

Creek Segments
- Newtown Creek 1
- Newtown Creek 2
- Newtown Creek 3
- Whale Creek
- Dutch Kills
- Maspeth Creek
- English Kills

Creek Miles (tenths)

Site Property Boundary

Feet
0 100 200 300 400

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Notes:
1. Outfall labeling: BB: Bowery Bay; NC(B/Q): Newtown Creek, Brooklyn/Queens; ST: Stormwater; SPDES: State Pollutant Discharge Elimination System.
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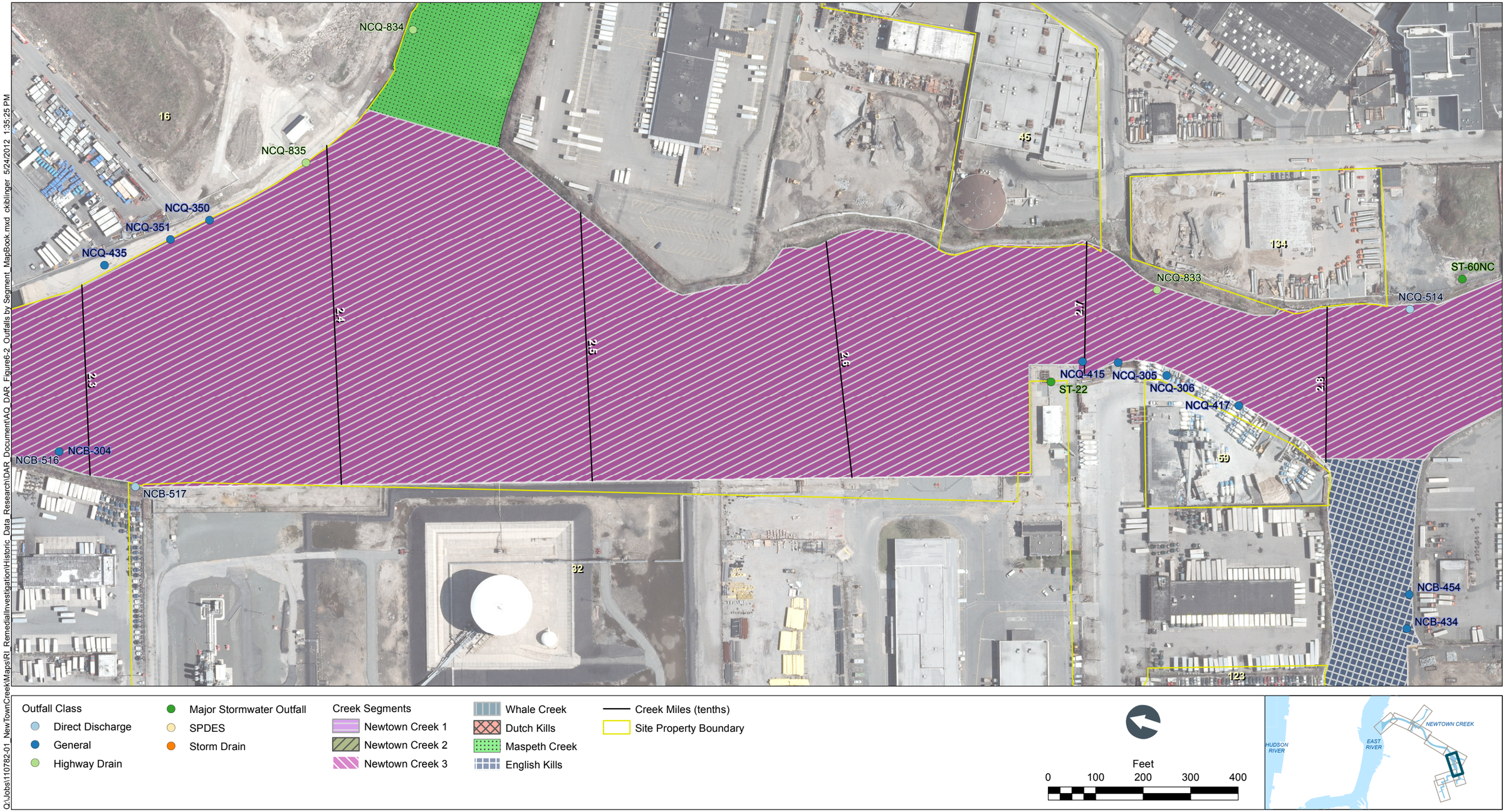
Figure 6-2d
Outfalls by Segment - Newtown Creek 2
Data Applicability Report
Newtown Creek RI/FS



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Notes:
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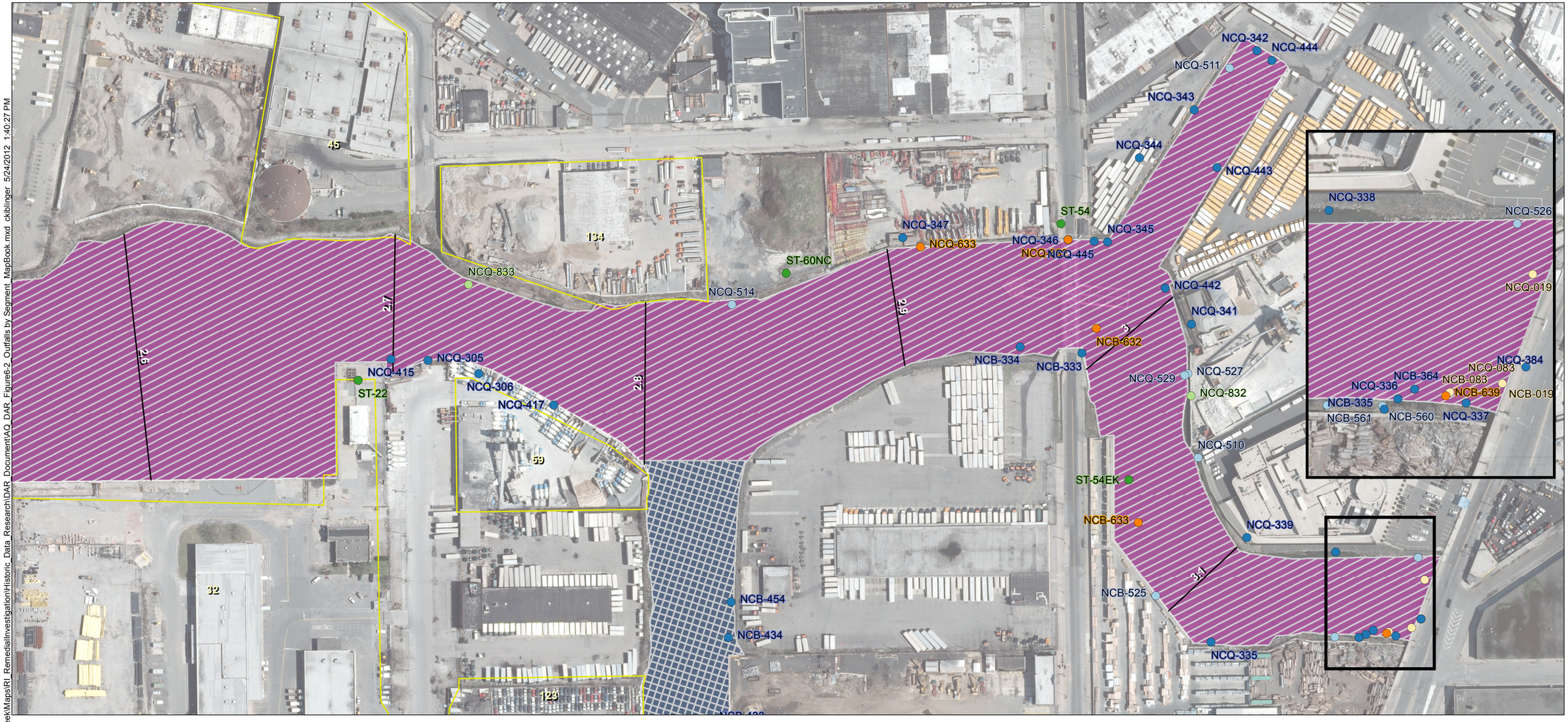
Figure 6-2e
Outfalls by Segment - Newtown Creek 3
Data Applicability Report
Newtown Creek RI/FS

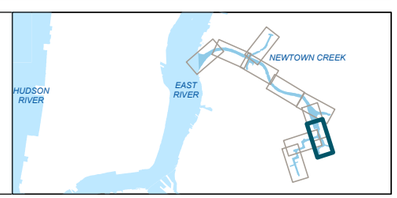


Outfall Class
- Direct Discharge
- General
- Highway Drain
- Major Stormwater Outfall
- SPDES
- Storm Drain

Creek Segments
- Newtown Creek 1
- Newtown Creek 2
- Newtown Creek 3
- Whale Creek
- Dutch Kills
- Maspeth Creek
- English Kills

- Creek Miles (tenths)
- Site Property Boundary

Feet
0 100 200 300 400



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Notes:
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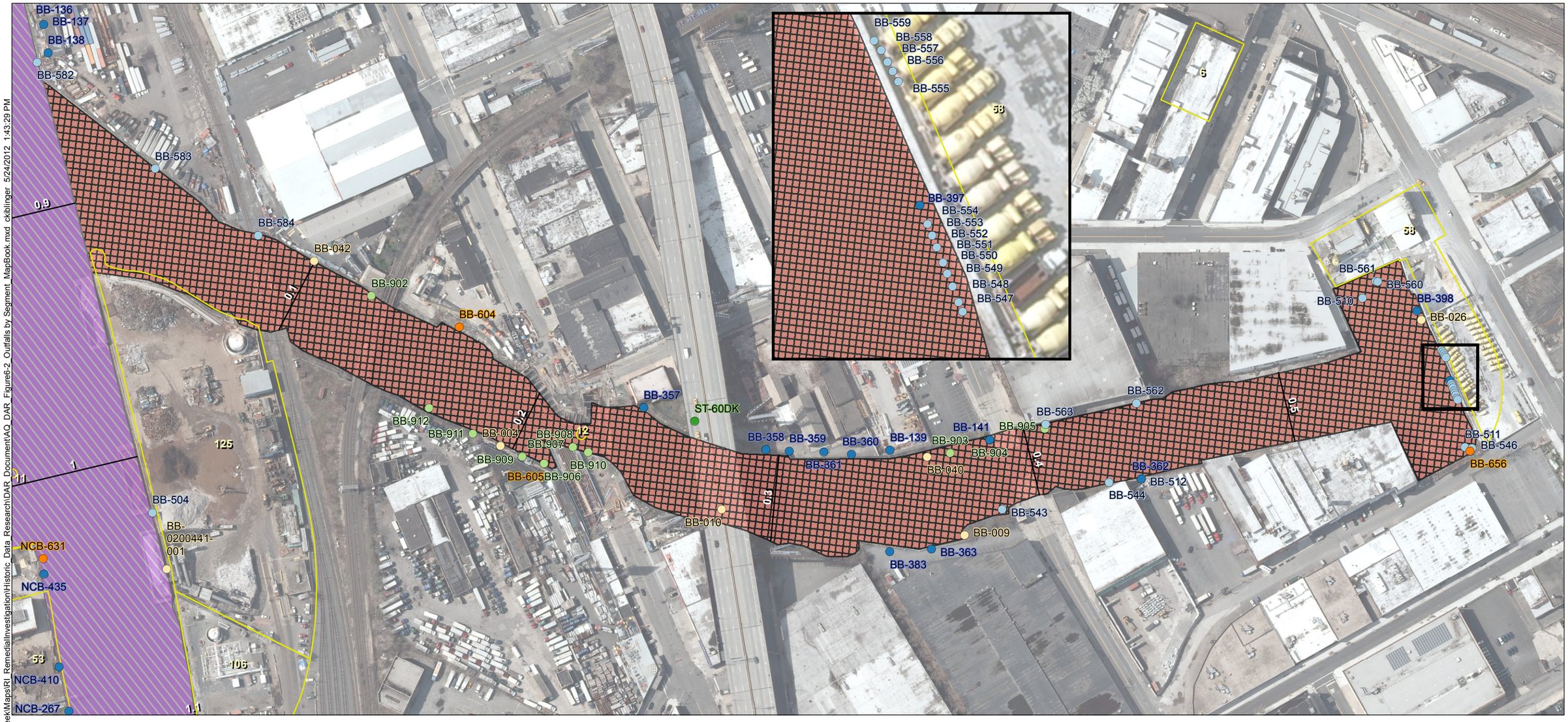
Figure 6-2f
Outfalls by Segment - Newtown Creek 3
Data Applicability Report
Newtown Creek RI/FS



Q:\Jobs\1107782-01_NewTownCreek\Maps\RI_RemedialInvestigation\Historic_Data_Research\DAR_DocumentAQ_DAR_Figure6-2_Outfalls by Segment_MapBook.mxd ckiblinger 5/24/2012 1:43:29 PM

Notes:
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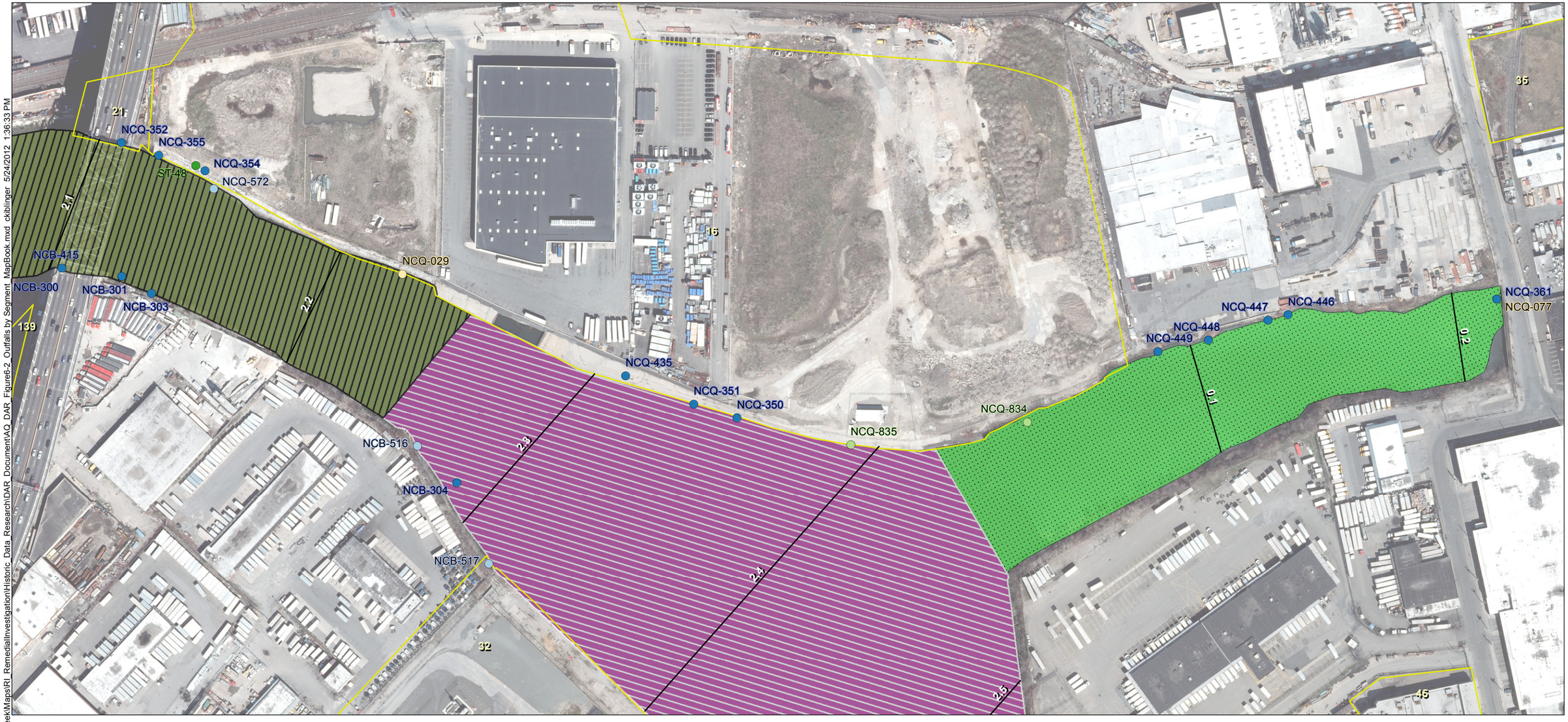
Figure 6-2g
Outfalls by Segment - Dutch Kills
Data Applicability Report
Newtown Creek RI/FS



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Notes:
1. Outfall labeling: BB: Bowery Bay; NC(B/Q): Newtown Creek, Brooklyn/Queens; ST: Stormwater; SPDES: State Pollutant Discharge Elimination System.
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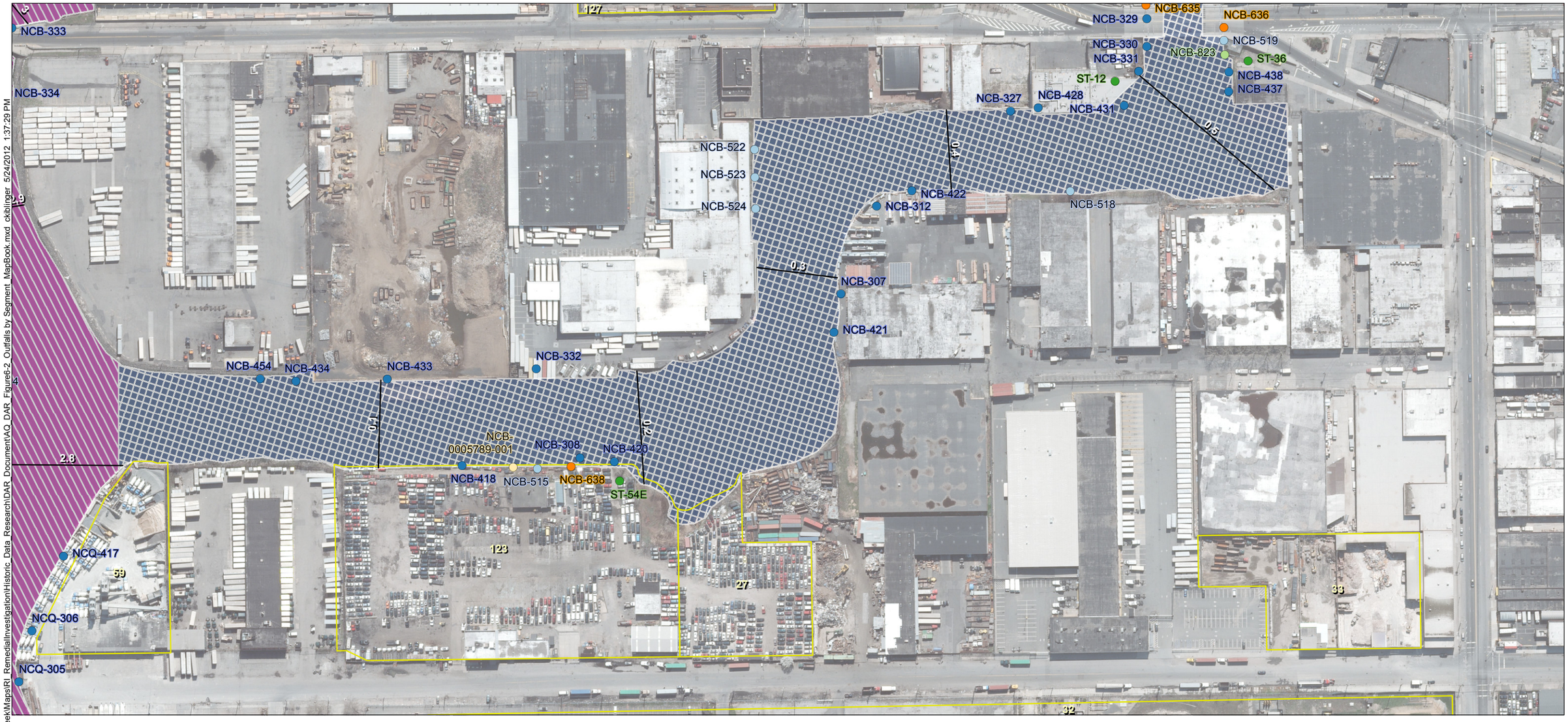
Figure 6-2h
Outfalls by Segment - Maspeth Creek
Data Applicability Report
Newtown Creek RI/FS



Outfall Class
- Direct Discharge
- General
- Highway Drain
- Major Stormwater Outfall
- SPDES
- Storm Drain

Creek Segments
- Newtown Creek 1
- Newtown Creek 2
- Newtown Creek 3
- Whale Creek
- Dutch Kills
- Maspeth Creek
- English Kills

Creek Miles (tenths)

Site Property Boundary

Feet
0 100 200 300 400

HUDSON RIVER
EAST RIVER
NEWTOWN CREEK

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Notes:
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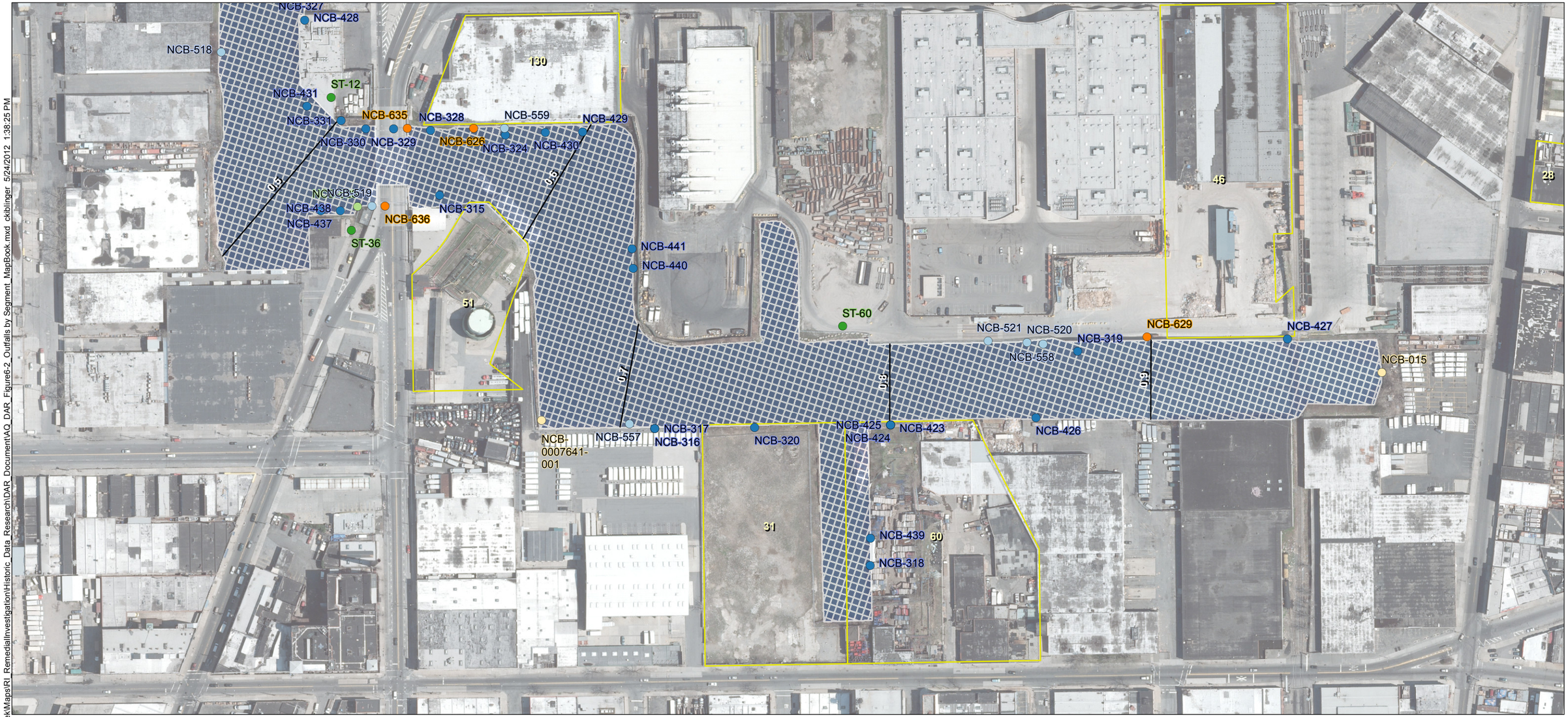
Figure 6-2i
Outfalls by Segment - English Kills
Data Applicability Report
Newtown Creek RI/FS



Outfall Class
- Direct Discharge
- General
- Highway Drain
- Major Stormwater Outfall
- SPDES
- Storm Drain

Creek Segments
- Newtown Creek 1
- Newtown Creek 2
- Newtown Creek 3
- Whale Creek
- Dutch Kills
- Maspeth Creek
- English Kills

- Creek Miles (tenths)
- Site Property Boundary

Feet
0 100 200 300 400

HUDSON RIVER
EAST RIVER
NEWTOWN CREEK

Q:\Jobs\110782-01_NewTownCreek\Maps\RI_RemedialInvestigation\Historic_Data_Research\DAR_Document\AQ_DAR_Figure6-2_Outfalls by Segment_MapBook.mxd ckiblinger 5/24/2012 1:38:25 PM

Notes:
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Figure 6-2j
Outfalls by Segment - English Kills
Data Applicability Report
Newtown Creek RI/FS

APPENDIX A
REGULATORY DATABASE SUMMARIES (AVAILABLE ON CD)

APPENDIX B
UPLAND SITE SUMMARIES
(AVAILABLE IN BINDERS 2 THROUGH 4)

APPENDIX C
RESPONDENT SITE SUMMARIES
(AVAILABLE ON CD)